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THESIS

TQL IMPLEMENTATION PROCESS IN THE U.S. NAVY: A CASE STUDY ONBOARD THE USS CARL VINSON, AND ITS APPLICABILITY TO CHILEAN NAVY WARSHIPS

by

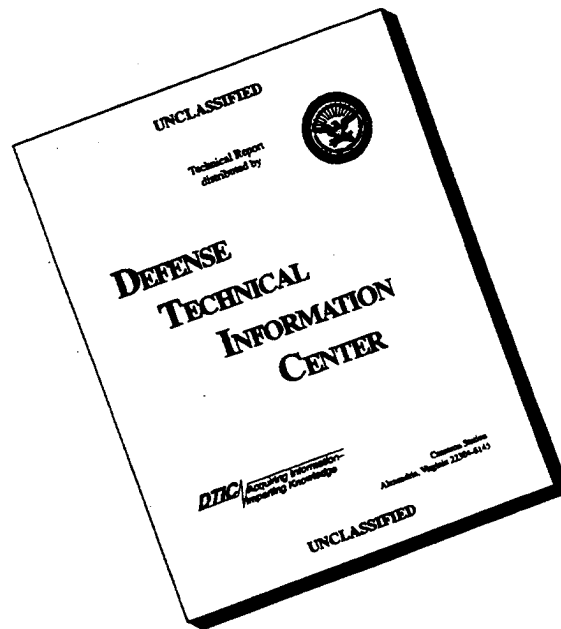Roberto P. Carvajal

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Two of the main aspects that preclude a Navy from engaging in a quality management philosophy, like Total Quality Leadership (TQL), are the uncertainty related to the applicability of that philosophy in a warship environment and the potential negative effects the philosophy might have on the values and beliefs that characterize a Navy. To address these issues, this thesis assesses the TQL implementation process onboard the USS Carl Vinson and from that experience analyzes how a quality management approach like TQL would fit in the Chilean Navy warship environment. Using personal interviews, written questionnaires to top leadership and the crew, a case study of the implementation process onboard the USS Carl Vinson was developed and then analyzed using Dr. W.E. Deming's philosophy of management, in particular his Fourteen Points. The Chilean Navy culture and its warship environment were described and then analyzed in the light of the experience onboard the USS Carl Vinson to determine the applicability of TQL in Chilean warships. Conclusions and recommendations from the research are expected to be helpful for the Chilean Navy as well as for the USS Carl Vinson.

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TQL IMPLEMENTATION PROCESS IN THE U.S. NAVY: A CASE STUDY ONBOARD THE USS CARL VINSON, AND ITS APPLICABILITY TO CHILEAN NAVY WARSHIPS

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Submitted in partial fulfillment

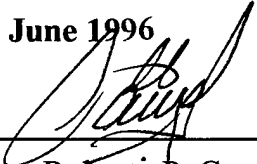of the requirements for the degree of

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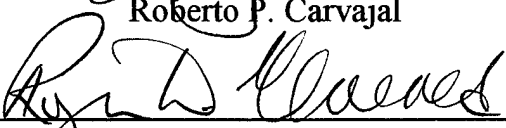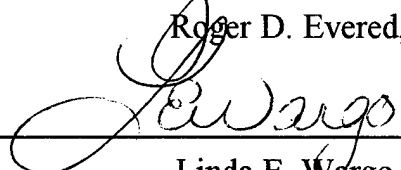from the

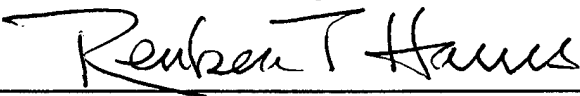**NAVAL POSTGRADUATE SCHOOL**

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ABSTRACT

Two of the main aspects that preclude a Navy from engaging in a quality management philosophy, like Total Quality Leadership (TQL), are the uncertainty related to the applicability of that philosophy in a warship environment and the potential negative effects the philosophy might have on the values and beliefs that characterize a Navy. To address these issues, this thesis assesses the TQL implementation process onboard the <u>USS Carl Vinson</u> and from that experience analyzes how a quality management approach like TQL would fit in the Chilean Navy warship environment. Using personal interviews, written questionnaires to top leadership and the crew, a case study of the implementation process onboard the USS Carl Vinson was developed and then analyzed using Dr. W.E. Deming's philosophy of management, in particular his Fourteen Points. The Chilean Navy culture and its warship environment were described and then analyzed in the light of the experience onboard the <u>USS Carl Vinson</u> to determine the applicability of TQL in Chilean warships. Conclusions and recommendations from the research are expected to be helpful for the Chilean Navy as well as for the <u>USS Carl Vinson</u>.

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I. INTRODUCTION

This chapter explains the objective of this thesis, its scope and limitations, the specific research questions for which this research effort should find answers, and the organization of the study. This thesis assumes the reader has little knowledge and experience of total quality concepts and the U.S. Navy approach to quality management. If the reader is already familiar with these concepts, it may be helpful for them to scan Section D, Organization of the Study, to identify and go directly to areas of interest.

A. OBJECTIVE OF THE THESIS

The primary purpose of this thesis is to provide an objective assessment as to the applicability of a quality management philosophy onboard a warship. The author designed a case study to assess the Total Quality Management (TQL) implementation process onboard the USS Carl Vinson. Research efforts concentrated on positive outcomes and potential barriers to TQL implementation onboard the USS Carl Vinson.

In addition, this thesis has a secondary purpose: to assess the applicability of a quality management philosophy, like TQL, onboard the Chilean warships' environment. To that purpose, the author analyzed how a philosophy like TQL would fit with the Chilean Navy culture and, particularly, the Chilean warships' environment.

B. SCOPE AND LIMITATIONS

The scope of this thesis is to provide the Chilean Navy and the USS Carl Vinson with a document expected to be useful as a formal background for further analysis around quality management or TQL onboard warships. For the Chilean Navy it should be helpful in assessing the feasibility and/or convenience of adopting a quality management philosophy onboard its ships. For the USS Carl Vinson it should be useful in assessing the TQL implementation process they are currently adopting.

Research about TQL consisted of six months of concentrated reading and review of current literature available on quality management and TQL, plus completion of a TQL course at Naval Postgraduate School (NPS). Information about the TQL implementation process onboard the USS Carl Vinson is based primarily on document reviews, responses to a written

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questionnaire addressed to selective USS Carl Vinson top leadership, personal interviews with the Commanding Officer and the Command TQL Coordinator, responses to a questionnaire addressed to a sample of the crew, and the analysis of two specific process improvements selected by the ship.

Information about the Chilean Navy culture and its warships' environment is based primarily on the author's experience. In addition, the most important regulations from the Chilean Navy were used to complement the author's opinion. Lack of time and distance precluded the use of more reliable research techniques such as interviews and surveys. Written questionnaires, further literature review, and climate surveys addressed to a sample of the Chilean Navy personnel are considered as sound additional research techniques for this purpose. This is especially recommended if the Chilean Navy decides to consider any quality management approach to be applied in the future.

C. RESEARCH QUESTIONS

The following specific research questions will be addressed in this thesis:

1. Primary Research Questions

    - What are the main positive outcomes after implementing the TQL philosophy onboard the USS Carl Vinson?

    - What are the main obstacles in implementing TQL onboard the USS Carl Vinson?

    - What are the main obstacles in implementing TQL onboard the USS Carl Vinson?

2. Secondary Research Question

    - What are the main experiences from the TQL implementation process onboard the USS Carl Vinson for future applications in Chilean warships?

D. ORGANIZATION OF THE STUDY

Chapter I establishes the objective of this thesis, its scope and limitations, the specific research questions addressed through the study, and also introduces the general direction of the research effort.

Chapter II describes the basic elements of quality management considered helpful for readers who are not familiar with these concepts. It also explains the US Navy approach to quality management.

Chapter III discusses the methodology and research techniques used in this thesis to collect data and conduct the required analysis to provide answers to the research questions.

Chapter IV analyzes the TQL implementation process onboard the USS Carl Vinson focusing on the main positive outcomes and potential obstacles for TQL implementation onboard the ship.

Chapter V analyzes the Chilean Navy culture to assess the applicability of a quality management approach like TQL onboard its warships.

Chapter VI develops conclusions on the results of the thesis, provides answers to the research questions, makes recommendations for hypothetical future application of any quality management approach by the Chilean Navy, and identifies areas for future research.

II. QUALITY MANAGEMENT AND TQL

This chapter describes the basic elements of quality management considered useful for those readers who are not familiar with these concepts. The author considered it important to include this chapter to provide a common language and a conceptual framework from which the reader can easily understand the U.S. Navy approach to quality management. The chapter begins with definitions of basic terms that are repeatedly mentioned during the thesis. A summarized description of W. E. Deming's approach to quality management as this philosophy constitutes the basis for the Department of the Navy approach is included in Section B. Section C summarizes other approaches to quality management and describes the Department of the Navy (DON) approach to quality management, known as Total Quality Leadership (TQL).

A.   BASIC DEFINITIONS

A comprehensive glossary of terms is provided in Appendix A. Concepts will be discussed when describing specific approaches to quality management later in this chapter. In order to provide a common understanding of different terms used extensively throughout this thesis, main operational definitions, as extracted from the DONs Fundamentals of Total Quality Leadership Students Guide, November 1992 [Ref. 1: pp. D1-D16] are described below:

1. Customer.

The person or group who establishes the requirements or expectations of a process and receives or uses the output of that process. For example, a ship is a customer of various services such as major maintenance and specialized training activities which are provided by some shore facilities.

2. External Customer.

An individual or group outside the boundaries of the producing organization who receives or uses the output of a process.

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3. Internal Customer.

Individual or group inside the boundaries of the producing organization who receives or uses the output of a process within the organization. For example, crew members are considered as internal customers of the welfare system onboard a ship.

4. Mission Statement.

Defines the fundamental, unique purpose that sets a business apart from other firms of its type and identifies the scope of the business's operations in product and market terms. It provides the foundation for priorities, strategies, plans, and work assignments. It is the starting point for the design of leadership jobs and structure. It specifies the fundamental reason why an organization exists.

5. Objectives.

Specific, measurable midterm and short-term performance targets necessary for achieving long-term strategic goals. For example, the availability of aircrafts in an aircraft carrier is a necessary objective for the battle group to meet its strategic goals.

6. Outcome.

The way the customer responds to the product or service. For example, if a ship is not trained enough (output), the fleet will have to make some adjustments to try to maintain operational capabilities as a whole (outcome).

7. Output.

The result of the organization taking inputs and transforming them into products or services.

8. Paradigm.

A set of rules based on an explicit or implicit set of assumptions that explains how things work or ought to work. For example, the belief that sharing pre-established and semi standardized moral values among military personnel is a key element for success in the military environment is a paradigm for many military organizations.

9. Performance Goal.

A major individual or organizational output or outcome which results from operational performance and is measurable, and desired. For example, the desired, minimum, or standard percentage of targets in a real-fire exercise with a ship's main battery, measured in certain standard conditions, is a performance goal for the ship.

10. Process.

A series of related steps, activities, or actions within a system that repeatedly come together to transform inputs into output. The inputs may include people, methods, material, equipment, environment, and information. There can be several stages to the process, or each stage could be viewed as a process. The output is a product or service.

11. Process Improvement.

The continuous endeavor to learn about the cause system in a process and to use this knowledge to change the process to reduce variation and complexity and to improve customer satisfaction.

12. Product.

A product is the output of any process and may be classified as (a) goods (pertains to physical things such as ammunition, fuel oil, or rotor blades), (b) information (as in operational intelligence, annual reports, or a technical advice), or (c) services (work performed for someone else such as recruiting, transportation, or maintenance).

13. Quality.

A characteristic or the value of a product or service from the perspective of the user. The extent to which a product or service meets or exceeds customer requirements and expectations. Good quality does not necessarily mean high quality. It means a predictable degree of uniformity and dependability at low cost, with a quality suited to the market.

14. Quality Management.

Systematic analysis and improvement of a causal system rather than actions taken on the output. This concept is further discussed when introducing Deming's approach to quality management.

15. Supplier.

The person or group that provides an input to the process. For example, shore facilities (supplier) provide training to the fleet (customer).

16. External Supplier.

An individual or group outside the boundaries of the receiving organization that provides materials, products, information or services to an individual or group inside the boundaries of the receiving organization.

17. Internal Supplier.

An individual or group within the boundaries of an organization (department/ division/office) that provides materials, services, or information to another individual or group within the organization.

18. System.

A collection of parts that interact with each other to function as a whole, or, a series of functions or activities within an organization that work together for the aim of the organization. For example, a ship is a system.

19. Total Quality.

An extension of the quality concept to include improvement of all of the quality characteristics that influence customer-perceived quality. This includes sources of variation from incoming supplies, all of the significant processes within an organization, and all those that can influence customer satisfaction, needs or expectations when the product (or service) has left the organization. Systematic improvement of all of these sources of variation is referred to as total quality management.

20. Common Causes (of variation).

Those causes of variation that are inherent in the process over time, affect everyone working in the process, and affect all outputs of the process. Lack of training in new technology is a typical example of a common cause of variation onboard warships that prevent the ship to reach higher levels of performance in the use of certain equipment.

21. Special Causes (of variation).

Causes that are not in the process all the time or do not affect everyone, but arise because of specific circumstances. Sources of variation that are unpredictable or unstable. Low performance of an operational team due to the demotivation of some of its members is a typical example of a special cause of variation onboard a ship.

22. Vision Statement.

A written document describing an idealized view of where or what an organization would like to be in the future.

B. DEMING APPROACH TO QUALITY MANAGEMENT

This section describes the Deming approach to quality management as this is the philosophy adopted by the US Navy. The main elements associated with Deming's approach include the "System of Profound Knowledge," the use of the scientific method known as the "Plan-Do-Check-Act" (PDCA) Cycle for process improvement, and the "Fourteen Points."

Figure 1 illustrates Deming's approach to quality management. The purpose of the system of profound knowledge is to provide the required understanding that will lead to effective improvement. The PDCA cycle provides a scientific method for systematically gaining knowledge based on data. The Fourteen Points represent Deming's road map for quality management. They are an application of the System of Profound Knowledge. [Ref. 1: pp. 6-7]

Deming's philosophy, as well as other approaches to quality management discussed in the next section, is considered as pertaining to the Fourth Generation Management in which managers cared greatly about results, but also recognized that better results can also be obtained through fundamental improvement. [Ref. 26: p. 10]

1. System of Profound Knowledge

Deming stated in his seminars that there is no substitute for knowledge. Moreover, he asserted that without profound knowledge management action could be even harmful. Good intentions, hard work, best efforts, and new technology are not enough to ensure success. For this reason, understanding the concepts of profound knowledge is crucial to internalizing Deming's approach to quality. The system of profound knowledge is made up of four interrelated parts: systems theory, variation, theory of knowledge, and psychology of individuals and organizations.

The first part of the system of profound knowledge is systems theory [Ref. 1: pp.6-7]. Deming defined system as a series of functions or activities within an organization that work together for the aim of the organization. Without an aim, there is no system. The components of a system and its interrelationships to each other must be studied. One of the best ways to coordinate and integrate efforts within an organization is to view it as a system.

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People can do their work more effectively if they understand what the organization is trying to accomplish. In other words, Deming's philosophy is a systemic approach.
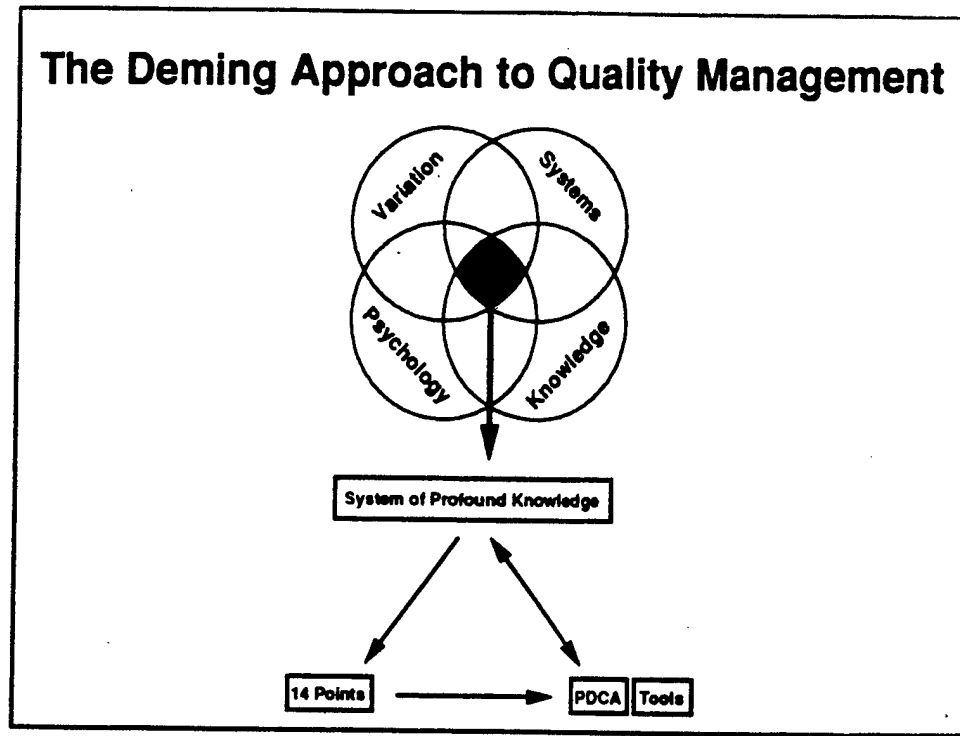
Figure 1. The Deming Approach to Quality Management.

Variation is the second part of the System of Profound Knowledge. Knowledge about the statistical concepts of variation is also essential for an organization to consistently and predictably produce quality products or services. Managers should be able to use statistical tools to recognize a stable system and understand the concepts of common and special causes of variation.

Deming insisted that it is the responsibility of management to reduce sources of common causes of variation [Ref. 1: pp. 43-44]. As managers own the processes, they have

the authority to take action on the system's processes. On the other hand, action on special causes of variation is taken by those workers involved in the day-to-day process operation.

According to Deming, failure to appreciate the difference between special and common causes of variation will lead to frustration, increased variability, and higher costs. These adverse effects result from management taking action and responding to problems without knowing if the cause belongs to the system or if it is localized. Measurement and analysis of variation provide the means for predicting the behavior of a system. In fact, when the process is stable (i.e., when all data points fall randomly inside the control limits), the process' owner is able to predict future output with reasonable certainty. Interested readers may refer to Chapter 20 of "The Deming Management Method" [Ref. 28: pp. 96-118] written by Mary Walton, for a more in-depth explanation about these statistical concepts.

The third part of the system of profound knowledge is the theory of knowledge. It addresses the way in which knowledge is advanced. The process of gaining knowledge is generally slow, with incremental growth based upon experimentation and theory. However, occasionally "breakthroughs" occur that produce rapid advances in knowledge. Managers need to learn how to increase their knowledge of the processes for which they are responsible by participating in scientific activities, such as formulating theories, developing hypotheses, designing and conducting experiments. [Ref 1: pp. 16-17]

To Deming, managers should be very careful at looking elsewhere for solutions. To copy an example of success, without understanding it with the aid of theory, may lead to disaster. A common false start encountered by organizations beginning to focus on quality is their failure to understand the importance of learning the theory of quality management. No two organizations are alike, each has different requirements and may require tailored applications of the theory.

Knowledge provides a systematic, instead of a haphazard, way of learning more about processes and how to improve them. It allows us to continually improve the organization's processes that produce our customer's products and services. Knowledge also provides a

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method to innovate for the future to design and test new processes and to develop new products and services our customers are not yet aware they will desire.

The last, but not the least, part of the system of profound knowledge is psychology. People cannot be treated as interchangeable parts. They are different from each other. Management needs to have knowledge of people and how they interact, of their individual needs, and of their working and learning styles. It is management's responsibility to be aware of those differences and to be sensitive to these needs to promote system optimization.

For example, people differ in their levels of motivation and their readiness for change. Deming felt the prime work motivator should be allowing the individual to take pride in his or her work. He clearly believed the manager's focus should be on intrinsic motivation rather than extrinsic. That is, motivation coming from within the person rather than motivation coming from outside and largely determined by the formal organization [Ref 1: pp. 13-14]. On the other hand, some people view change as a challenge and accept it readily while others may seek ways to resist it. An important issue related to readiness to change is whether individuals fail to change because they cannot change (an ability problem) or because they will not change (a motivation problem). The appropriate management actions in these cases will differ depending on the reason for the resistance.

Process improvement requires a team-based management approach. Teams are needed to facilitate process improvement, foster ownership and synergy, increase motivation, and avoid suboptimization. Teamwork fosters cooperation across organizational boundaries, and allows an organization to adapt quicker to rapidly changing environmental demands. A central theme of Deming's management approach focuses on the importance of cooperation and the negative effects of competition. Working in a team with an agreed-upon goal decreases the likelihood of competition among the members and increases the probability of success.

For quality management to be successful, the organization's culture should foster the creative and innovative potential of people. Cultural transformation requires changes in many areas, including knowledge, attitudes, behaviors, reward system, organizational structure,

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integrative devices, communication, and leadership. Leaders need to talk more with the people they directly supervise. They should also periodically talk with people at all levels in the organization to communicate their ideas and enthusiasm about what the organization is trying to do. Leaders should also listen to what their people are saying about the view from their part of the organization.

2. The PDCA Cycle

The Plan-Do-Check-Act cycle represents a systematic way of increasing knowledge of processes and of implementing change to assess whether improvements resulted. Deming emphasized continual improvement and believed it is management's obligation to constantly and forever improve the system of production and service. Figure 2 depicts the PDCA Cycle in a graphic way [Ref. 1: pp. 22-23].
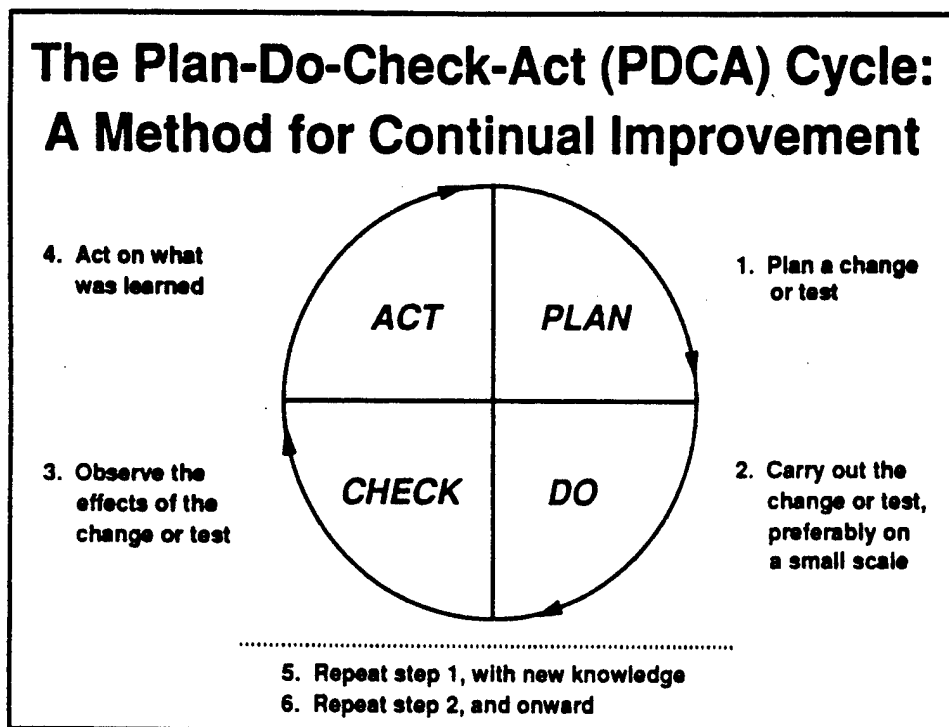
Figure 2. The PDCA Cycle.

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First, the model directs us to identify and plan the changes we want to make. Top management should ensure that these plans relate to the organizational goals. To evaluate these changes we must decide what data we need. The plan should include how the data will be gathered, how often data will be collected, and who will gather and record the data. The data we require is usually easily available in the process.

Second, in the do phase we make the changes that will help answer the questions we posed in the hypotheses. Since we are testing the effects of changes, it is better to implement the changes on a small scale, as a pilot test. The effects of these changes are measured over time so they can be compared with measures taken before the changes. Measure criteria is defined by the customer's quality characteristics you are trying to assess. After making some changes, we have to determine whether the changes resulted in improvements or not. That is, we must continue to monitor the process and collect data while testing the changes.

Third, we check by observing the effect of the changes or test. The manager's main task is to put meaning into the data. The issue is to determine whether the changes effectively resulted in improvements. If so, the next question is whether the findings can be generalized to the larger organization. If the hypotheses were not supported, the next step is to determine what was wrong with the experiment and, if necessary, plan to identify and retest with another set of changes.

At this point of the model it is convenient to bring to the analysis the importance of managers having the required mastery of statistical tools and concepts to derive relevant and valid conclusions from the data. Deming emphasized in several passages of his books, videos, and articles the critical role played by statistics in helping managers cope with any process improvement technique. Management's success will depend on the extent to which they apply the knowledge they have acquired from the process. The check phase provides the structure for assessing the data and acting accordingly.

Finally, in the last phase of the PDCA Cycle, we identify and act on what we learned. We compare the data collected with our predictions and modify our hypotheses accordingly. In this way, we evaluate the consequences of our actions. After defining that the changes

were successful; that is, improvement resulted, a formal change in process procedures must be made. A formal change means that new procedures are documented in written form (standardization). It is also important to train employees who are affected by the changes. Managers should think of means to standardize the process to ensure it will not turn back to the original way.

3.   The Fourteen Points

According to Deming, the "Fourteen Points" or "Fourteen Obligations for Management" apply anywhere, in any organization, regardless of size or type of business. These points provide the basis for initiating and sustaining an organizational transformation that focuses on customer satisfaction through quality. Deming said: "Adoption and action on the fourteen points are a signal that the management intends to stay in business and aim to protect investors on job." To adopt the fourteen points, management needs to put aside short-term thinking for the long-term good of the organization so that they can be in business tomorrow.

Deming's view about the fourteen points was the main factor taken into account by the author to assess the application of the quality management philosophy onboard a warship. The fourteen Points are a road map to change. Organizations can decide to start with some of them or with all of them at a time. The important thing to consider is that regardless the way organizations decide to start, they must score high in all the Fourteen Points if they are to be fully implementing Deming's approach to quality management.

The following is a summarized list of Deming's Fourteen Points updated to 1989: [Ref. 2: pp. 145-183]

> Point #1.   Create and publish to all employees a statement of the aims and purposes of the organization. The management must demonstrate constantly their commitment to this statement.

In this point Deming says that the organization, as a system, must decide what its aims are, must publish those aims, and must demonstrate its commitment over time to those aims.

Onboard warships this means that leadership must develop and disseminate the mission, vision, and guiding principle statement reachable and understandable to all crewmembers.

Point # 2.   Learn the new philosophy.

This point focuses on the importance of everyone in the organization learning to assume his and her new responsibilities, beginning with learning what those responsibilities are. In a warship as well as in any organization this is valid not only for top leadership but also for everybody. The new philosophy concentrates on the systems approach where the entire system is optimized rather than several isolated attempts to optimize small lumps in the system [Ref. 29: pp. 168-169].

Point #3.   Understand the purpose of inspection for improvement of processes and reduction of cost.

This point emphasizes that focusing in process improvement is not only cheaper than inspection but it also provides a way to improve processes continually by making data-based decisions. However, Deming did not advocate eliminating inspection but rather ceasing dependence on them to achieve quality because it is too late and too expensive.

Point #4.   End the practice of awarding business on the basis of price tag alone.

This point emphasizes that organizations must change their relationship with suppliers so that helping them to improve the materials and services they provide. According to Deming, ships must not rely only on the price of a product or service as the basis for buying.

Point #5.   Improve constantly and forever the system of production and service.

In this point Deming addressed the importance of continual improvement of processes for TQL. When thinking about this point the reader should remember that a system is made of processes.

Point #6.   Institute training for skills.

This point focuses on the need for the organization to make sure its people are properly trained to understand and do their jobs. According to Deming, this point refers mainly to training of management and new employees. [Ref. 30: p. 54].

Point #7.   Teach and institute leadership.

This point emphasizes some ways that leaders at all levels onboard the ship need to change to enable TQL to become the new way of doing business. In this point, leadership refers to supervisory behavior and not to a specific position within the organization.

Point #8.   Drive out fear. Create trust and a climate for innovation.

This point addresses the importance of getting rid of fear if an organization wants to institute TQL. This point can be seen as central to all the other points in that, if an organization does not drive out fear, it will be difficult or impossible to enact the other points.

Point #9.   Break down barriers between departments.

This is the teamwork point. It calls for leaders to break down barriers between departments and work together to solve problems as a team. Effective teamwork at all levels in the organization is a major implementing and sustaining mechanism for TQL.

Point #10.   Eliminate slogans, exhortations, and targets for the work force.

This point emphasizes that exhortations by themselves do not help people do the job better. It also recognizes that slogans can be demotivating and that most problems are due to the system itself.

Point #11. Eliminate numerical quotas for the work force and numerical goals for management.

In this point Deming attacked the traditional management method of setting numerical targets without basing these targets on the data-based measures of a process.

Point #12. Remove barriers that rob people of pride of workmanship.

In this point, Deming recognized that everyone in an organization has the right to be proud of his or her work and that anything that stands in the way of this is a barrier to pride of workmanship.

Point #13. Encourage education and self-improvement for everyone.

In this point Deming believed there is something inherently good about education. Education, even for its own sake, is good for people and will eventually add something positive to an organization and society.

Point #14. Take action to accomplish the transformation.

This point calls for action. The transformation will not happen just by issuing orders. It requires study and constant work by everyone in the organization. It also recognizes that a paradigm shift from current practices to total quality requires a transformation.

C. OTHER APPROACHES TO QUALITY MANAGEMENT

This section presents a summarized review about other main approaches to quality management, specifically those of Philip B. Crosby and Joseph M. Juran. It provides a conceptual framework intended to facilitate putting the specific approach selected by the U.S. Navy into context.

1. Crosby Approach

Crosby is well known for popularizing the concept of "Zero Defects." He defines quality as "conformance to requirements" which must be defined in clear terms to effectively

help the organization take action based on tangible targets, rather than on mere opinions. The foundation of Crosby's approach is prevention.

His philosophy is based on doing things right the first time and every time. Crosby stressed that the way to manage quality is by prevention, not detection and testing. For him, any product that falls within its design specifications is a quality product. He believes management creates most of its problems through its attitudes and practices which manifests in terms of what is rewarded and supported in an organization. For example, schedule will become the focus of the work if management decides that adherence to schedule is more important than quality. [Ref. 3: p. 4]

For Crosby, "defect-free" does not mean that the product has to be perfect. It means that every employee in the organization should be committed to meet the requirements the first time, and that not meeting the requirements is not acceptable. Acquiring and maintaining an attitude and commitment to defect prevention is the daily work of every individual. He says that prevention involves thinking, planning, and analyzing processes to anticipate where errors could occur, and then taking action to keep them from occurring. [Ref. 3: pp. 4-5]

Crosby's approach addresses prevention rather than inspection and correction of errors (see Figure 3 [Ref. 3: p. 6]). He says that prevention involves thinking, planning, and analyzing processes to anticipate where errors could occur, and then taking action to keep them from occurring. His prevention process begins by establishing the product or service requirement, developing the product or service, gathering data, comparing the data to the requirement, and taking action on the result. Crosby suggests this is a continuing activity.

Crosby has formulated a "quality vaccine" that consists of three distinct management actions: determination, education, and implementation. Determination is when management recognizes and takes action on the necessity to change their views about quality management. Education is helping employees develop a knowledge base for preventing problems. Implementation consists of the development of a plan with the required resources and support within the organization to make it feasible and ensure success.

The Prevention Process

```
┌─────────────────┐          ┌─────────────────┐
│   Establish     │  ──────► │    Measure      │
│  Requirement    │          │                 │
└─────────────────┘          └─────────────────┘
         ▲                            │
         │                            ▼
┌─────────────────┐          ┌─────────────────┐
│  Take Action    │ ◄─────── │    Compare      │
│                 │          │                 │
└─────────────────┘          └─────────────────┘
```
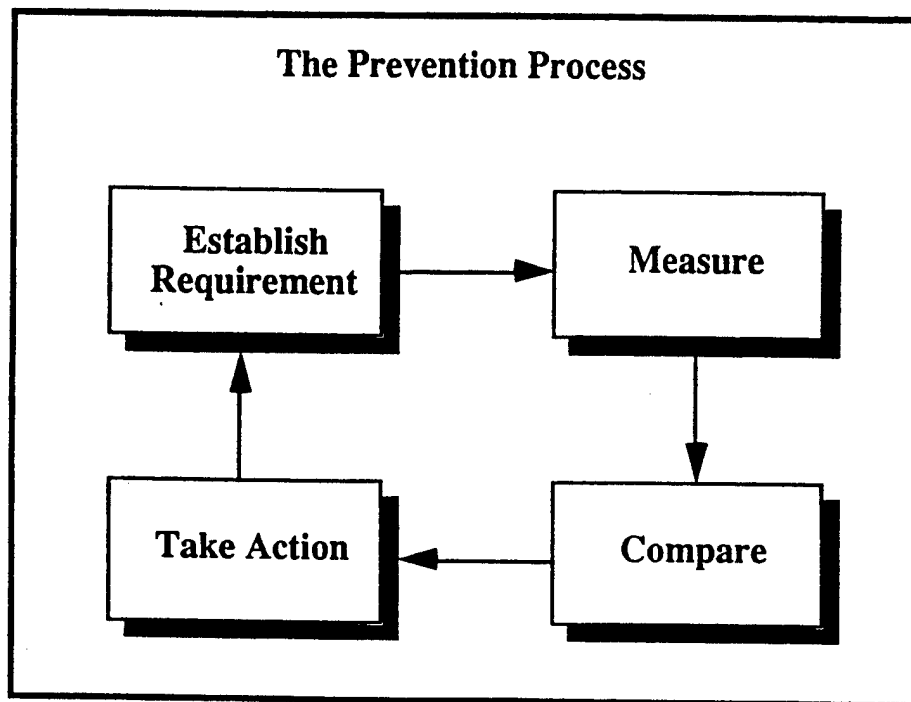
Figure 3. The Prevention Process.

Crosby's road map to quality management is given by the "Six C's." The first "C" is comprehension which addresses the importance of understanding what is meant by quality. The second "C" is commitment which must begin at the top and represents the stage when managers establish a quality policy. The third "C" is competence which emphasizes the importance of developing an education and training plan to implementing the quality improvement process in a methodical way. The fourth "C" is communication which addresses the importance of documenting and publishing all efforts so that complete understanding of quality by all people in the corporate culture is achieved. The fifth "C" is correction which

focuses on prevention and performance. Finally, the sixth "C" is continuance which emphasizes that the process must become a way of life in the organization.

2. Juran Approach

Juran defines quality as "fitness for use." He stresses a balance between product features and products free from deficiencies. By features, he does not mean luxury items but technological properties designed to meet the customer's needs. Juran's definition of quality reflects his strong orientation to meeting customers' expectations. According to Juran, anyone affected by the product is considered a customer. This includes the internal customers, those who deal with the product during its developmental stages, and the external customers, those who deal with the finished product.

Juran describes the series of specialized activities carried out by specialized departments by using a "spiral of progress in quality." The spiral shows actions necessary before a product or service can be introduced to the market. Each functional department in the spiral is given the responsibility to carry out its assigned special function. Quality results from the interrelationship of all departments within the organization. His approach includes, among other requirements, identifying the required activities according to the company's goals, assigning those activities to the various departments, and coordinating those departmental activities.

Juran says that organizations achieve improvement and innovation in terms of "breakthrough." That is, through dynamic and decisive movements to new and/or higher levels of performance. His breakthrough sequence involves activities that, if carried out properly, will result in improvements in quality and performance thus allowing the organization to engage in innovative products.

Breakthroughs can be resisted by managers who traditionally concentrate on control. To Juran, control activities have a short-term focus; they are necessary to hold onto gains, but will not lead to improvement and innovation. Breakthrough activities contribute to meet and exceed customer satisfaction. He says that the combination of breakthrough and control

are part of a continuing cycle of gains and plateaus in performance and that all managerial activity is directed at either breakthrough or control.

Juran's methodology requires project-by-project implementation. Top management selects the year's projects and appoints committees to address each one. The main task of these teams is to solve problems, but Juran distinguishes between "putting patches" on problems and removing the root causes of those problems. The teams' outcomes are documented and presented to the rest of the organization in an annual audit and the process of soliciting nominations for next year's projects is then repeated.

The "Juran trilogy" provides a systematic approach to carrying out Juran's methodology for managing for quality [Ref. 4: pp. 638-639]. Essential to implementation, however, is active leadership, starting at the top. This trilogy (see Figure 4 [Ref. 3: p. 15]) states that management for quality consists of three interrelated quality oriented processes; quality planning, quality control, and quality improvement. The first one involves developing a process that will achieve the established goals. Quality control concentrates on holding onto gains and not letting waste increase. The last one, quality improvement, focuses in lowering the cost of poor quality in existing processes and in using the lessons learned for seeking innovation to achieve better levels of performance. In this respect, Juran's approach addresses continuous improvement.

Because Juran emphasizes priorization of problems to be solved, the Pareto diagram is an especially useful tool to him. In general, the Pareto principle states that a few factors account for the largest percentage of a total. According to Juran, most of the cost of poor quality can be attributed to a very small number of causes called "the vital few." The other defects, called the "useful many" can be ignored for a time. In practice, this means to focus most of the efforts on those issues having the highest leverage power within the organization to pursue improvements.
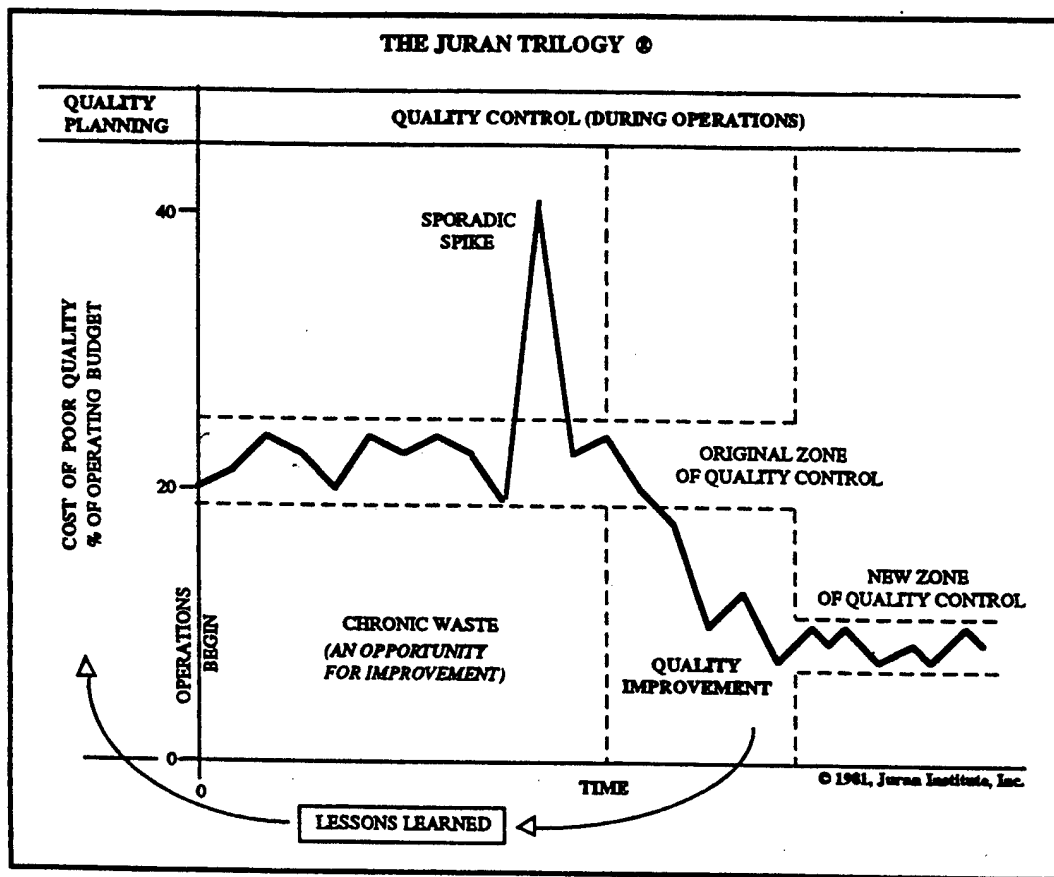
Figure 4. The Juran Triology.

D. DON APPROACH TO QUALITY MANAGEMENT

1. Genesis and Evolution of the Transformation in the DON

The facts show that the U.S. needs to improve its competitiveness in the world marketplace. After World War II, the U.S. relied on quality control to achieve quality and has focused more on quantity. It market share worldwide has declined and productivity has grown slowly since early 1970's [Ref 5: pp. 1-2]. In fact, the U.S. may not be able to continue to be the number one economic power in the world.

With the recession of the 1980's, pressures to eliminate the annual deficit and reduce the national debt, and the end of the cold war, Congress increased pressure on the

Department of Defense (DOD) to cut defense spending. With a decreasing defense budget and rising costs, the Department of the Navy (DON) still needed to maintain mission readiness. The Navy and Marine Corps needed to focus on quality to preserve the integrity of their mission. They needed to become more efficient in their processes to improve operational readiness in a downsizing environment [Ref. 31: pp. 206-207].

The Navy was forced to find a way to be more efficient in its processes while maintaining operational readiness. DON needed to deliver better combat readiness, better sustainability, better operational support, and a better infrastructure at reduced cost. TQL was considered the DON vehicle for achieving higher levels of performance with diminishing resources [Ref. 2: pp. 17-18]. Consequently, DON senior leadership has demonstrated commitment and provided support for the transformation to TQL. The last two Chief of Naval Operations (CNO), Admiral Frank Kelso and Admiral Mike Boorda's remarks on the Senior Leadership Seminar in 1991 and 1994, respectively, are a clear demonstration of that commitment. Admiral Kelso recognized that though the Navy had excellent people it was time to take into account the many ideas of that "old man" (referring to Dr. Deming) to do things better. He emphasized that the Navy was not able to continue doing business in the old way and that TQL was certainly the vehicle to perform better [Ref. 6: Video Tape 1]. Admiral Boorda said that he would continue with the same philosophy initiated by his predecessor. He emphasized his commitment to TQL [Ref. 7: Video Tape 2].

More recently, the Clinton Administration's National Performance Review (NPR), initiated in March 1993 to make government work better and cost less, has provided further impetus for the DON TQL transformation. NPR has tasked government agencies to identify problems and propose ways to improve service and efficiency in every unit of government. As Vice President Gore stated, "Our primary objective is to improve the quality of the services delivered" and to make the government "see the people and organizations it serves as customers." NPR focuses on cutting red tape, putting customers first, empowering employees to get results, and getting back to basics. TQL can help the DON meet the goals of the National Performance Review [Ref. 2: p. 17].

2. An Overview of the DON Implementation Plan

a. DON Efforts in Implementing TQL

DON focus on quality and process improvement efforts actually began in 1984 as pilot programs at Naval Aviation Depots (NAVAIR) and Naval shipyards [Ref. 8: pp. 147-165]. In 1989, NAVAIR received the first Presidential Award for Quality and Productivity Improvement. Their Total Quality Management (TQM) approach enabled NAVAIR to achieve substantial savings through acquisition streamlining and an increased number of mission-capable aircraft. This award administered by the Federal Quality Institute was created primarily to recognize organizations that have implemented TQM in an exemplary manner, resulting in high quality products and services and the effective use of taxpayer dollars.

In 1989, the Secretary of the Navy established the DON Executive Steering Group (ESG), a group of top leaders from the shore support establishment as well as from the Office of the CNO and from Headquarters Marine Corps. The group was formed to lead and guide TQM in the DON, beginning with the shore support activities. DON ESG decided to adopt the Deming approach to quality improvement.

One of the first tasks the ESG focused on was education and training for DON leaders and managers. Early in 1989, the group chartered the Educational and Training Quality Management Board to develop an education and training strategic plan for TQM. In 1991, the DON ESG formed the Education and Training Advisory Board to monitor the development and implementation of TQL education and training in the Department [Ref. 2: p. 26].

In 1990, the ESG officially adopted the term "Total Quality Leadership" as a way of recognizing the unique role of leadership in military operational commands and Deming's emphasis on leadership responsibilities [Ref. 2: p. 27].

In 1991, the CNO established TQL fleet teams to begin total quality education and training in operational units [Ref. 2: pp. 27-28]. The following are the main lessons learned

after implementation of TQL in eleven "demonstration" units, representing the three warfare communities: aviation, surface, and submarine [Ref. 9: pp. 5-26]:

1. An organization's readiness for change is CO/XO dependent.

2. Continued progress in TQL is dependent on the attention and commitment that a new CO brings to a command.

3. Positive feedback from the CO and Executive Steering Committee (ESC) reinforces commitment within the unit to TQL approach.

4. The atmosphere established by the CO has a tremendous influence on how teams function.

5. Top leaders must understand and communicate that change is neither quick nor easy.

6. The CO needs to attend the Senior Leader's Seminar and continue self-education in TQL to provide the necessary leadership and to ensure successful TQL implementation.

7. Selection of a TQL coordinator is indicative of the importance that the organization places on TQL and is critical to an organization's progress.

In 1992, the DON published the "DON Strategic Plan for TQL." Its vision statement addresses what the organization should be by the year 2,000. Later on, the ESG produced the DON Strategic Goals [Ref. 2: pp. 30-31]. In these documents, DON recognizes the necessity of a significant transformation throughout the naval services to achieve the vision and strategic goals. They also emphasize that achieving strategic goals will be neither quick nor easy but stress their confidence in the Navy-Marine Corps team and commit themselves to provide the direction and the required support for this transformation.

The strategic goals address and emphasize five commitments:

1. Integration of Navy-Marine Corps teams as a way to provide maximum operational capability by capitalizing on the synergism of their operating forces and support establishment;

2. Continuous improvement of the quality of the human resources through fact-based, innovative systemic changes affecting recruitment, training, and quality of life;

3. Continuous improvement of the acquisition process to achieve timely design, development, test, manufacture, and support of maritime weapon systems for the Navy-Marine Corps team;

4. Continuous improvement of the process of identifying and introducing new technologies. Ensuring recognition as a world leader in key maritime technologies. Creating a climate that fosters innovation and invention; and

5. Operating an adaptable and responsive shore facilities establishment properly sized and supported to allow continuous improvement in the quality of service to the operating forces.

As a result, in 1992 the DON published "From the Sea: Preparing the Naval Service for the twenty-first Century," a document that provides for the future direction of the Navy and Marine Corps as it faces the challenges of a new security environment and a changing national security policy. The new direction expressed in this strategic document is to provide the nation with "... naval expeditionary forces-shaped for joint operations-operating forward from the sea-tailored for national needs."

b. *The DON Two-Phased TQL Implementation Approach*

TQL was created as the principal leadership and management system for the DON's quality transformation. The basic DON TQL implementation strategy recognizes two components: the delegation of responsibilities for process management to field activities and headquarters' responsibilities for strategic change. This resulted in the DON two-phased TQL implementation approach.

Phase one, process management, consists of establishing the capability for practicing process management throughout the command. The practice of TQL requires that senior leaders identify and improve all of the command's processes that have a significant effect on mission performance. Process improvement is accomplished by teams.

Phase two, strategic management, consists of making the necessary changes in the organizational structures and personnel policies to ensure that TQL is an everyday practice in DON commands. There are implications for changes to a command's culture, leadership style, decision-making authority, and relationships with customers and suppliers. The methodology used to achieve these changes is known as strategic management. These changes require much more time than does process management. Moreover, it involves work at echelons higher than the majority of commands- often at headquarters or DON level.

Some basic elements of the DON Two-Phased TQL Implementation Approach are [Ref. 2: pp. 35-38]:

1. Establish a critical mass of leaders and managers. Education provides a common language, an important element in the quality transformation. A period of education is necessary for leaders and managers to understand the implications that TQL implementation has for their jobs and command mission. As Deming said: "a critical mass of people in the organization must understand what quality means and their role in achieving it."

2. Establish process management as the "new" job of leaders and managers in the command. Improvement efforts are focused on the processes important to enhancing mission performance. Each command must identify those processes and organize teams of process owners to improve them. It is also leaders' job to prioritize processes for improvement and is their responsibility to improve all significant processes. Process management is leaders and managers' "new" job.

3. Identify and remove impediments to TQL. Specific impediments must be identified and removed so that the political system (i.e., the one that reflects decision-making authority) and the cultural system (the one that reflects the collective values and beliefs of the people) can be brought into alignment to support process management. Some impediments, such as excessive or redundant inspections, cannot be resolved at the command level. These are to be surfaced through the chain of command to a level that is appropriate for their resolution.

c.   *DON's Implementation Structure*

DON Implementation Plan of 1988 established that "no specific or pre-established organization is required for implementation of TQL. A structure is needed for managers and workers to take the action required for continuous improvement of DON processes.

Subordinate commands may establish a structure which meets their needs consistent with the guidance in this plan." [Ref. 5: pp. 5-6]

A successful structured approach adopted by DON is known as the quality improvement team structure. It involves three types of boards with the following general roles:

(1)   The Executive Steering Committee (ESC). The ESC is made up of the top leadership in the organization. It is usually chaired by the commanding officer (or equivalent). Its membership most often includes the executive officer, department heads, and the command master chief. The primary concern of the ESC is to develop a strategic quality policy based on the new philosophy. This document includes a vision statement, the mission, and a set of guiding principles that serves to guide the daily behavior of everyone's commitment to TQL in achieving the mission.

The ESC must develop the TQL strategic plan, including strategic mission, related goals, and objectives. A strategic plan must focus on meeting customer requirements instead of meeting some financial target. The ESC must also work with its suppliers and help them understand their contribution in meeting command's aims [Ref. 1: pp. 29-31].

The ESC must identify its external customers and what they want in terms of product and service quality. It can then identify and prioritize the processes that are strategically important to the organization. Then, the committee selects middle managers from the functional areas involved in those processes and forms a Quality Management Board (QMB). Once each QMB is established, the ESC provides the resources for process improvement and supports decisions made by the QMBs that have been authorized in their charters. It is the responsibility of the ESC to see that any process changes considered by the QMBs do not suboptimize the organization as a whole.

(2)   Quality Management Board (QMB). Each QMB is a cross-functional team composed of the managers who are jointly responsible for the process to be improved. These individuals are commonly known as process owners. A QMB is responsible

for translating its charter into a process improvement plan. After flow charting the process selected for study, the QMB may want to work on obvious omissions or duplications in the process flow.

The QMB may charter a Process Action Team (PAT) to help the QMB, as necessary, in data collection and analysis. In such cases, the QMB must be ready to provide the PAT with resource and decision support. Before it permanently introduces changes to the process under study, the QMB must ensure that no other part of the process is being suboptimized. The QMB goes to the ESC for resolution when the scope of a proposed process change goes beyond the authority spelled out in the QMB's charter [Ref. 1: pp. 32-34].

To better describe what a QMB actually does, Figure 5 depicts a process management flow chart [Ref. 10: pp. 2-34]. The "Plan" phase of this chart is performed primarily by the QMB and is permanent over time. The "Do," "Check," and "Act" phases of this chart are done by the QMB with the assistance of one or more PATs as required.

(3)   Process Action Team (PAT). A PAT is normally chartered by a QMB and is composed of the subordinates who are most directly involved in a process that is under the span of control of one supervisor or manager. Unlike the ESC and QMB, the PAT is a temporary team that comes together to look at a specific issue. The primary role of the PAT is to collect data and solve problems.

The PAT's charter permits the people working in the process to reduce or eliminate local problems within certain boundaries. After reducing or eliminating the local problems, the PAT should be able to recommend to the QMB improvements to the system. The PAT should document the process analysis procedures and any actions taken on local problems [Ref. 1: pp. 35-36].

This quality improvement team structure recognizes that work should be organized by process (across functions) instead of by function. In this way, the people who work on the different parts of a process are linked together.

PROCESS MANAGEMENT FLOWCHART

- -1a- Identify Your Purpose
- -1b- Identify Your Customers
- -2a- Identify Major Products and/or Services
- -2b- Identify Customer Needs
- -2c- Identify Your Critical Products and/or Services
- -3- Identify Critical Processes
- -4- Define Critical Processes
- -5- Simplify and Refine Critical Processes
- -6- Select Process Measurements
- -7- Standardize - Perform the Present Process
- -8- Measure Process Results
- -9- Satisfactory? NO / YES
- -9a- Analyze and Improve the Process
- -10- Standardize

PLAN
DO
CHECK
ACT

Figure 5. Process Management Flow Chart.

This structure is consistent with the chain of command, facilitates the top-down transformation, and improves communication and the decision making process. The integration of the three types of teams is shown in Figure 6 [Ref 1: p. 43]. The down arrows indicate the downward flow of direction and resources. The up arrows indicate the upward flow of data and recommendations. The inner arrows represent the downward and upward links. The downward link is a member of the ESC when linking to a QMB, or a member of a QMB when linking to a PAT. This link should have some knowledge of the particular part of the process under study by the lower team. On the other hand, the upward link to the next higher level team is the QMB or PAT team leader.

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Besides the quality improvement teams, an organization needs a few other positions to support TQL. A TQL coordinator is required to provide technical support, training, documentation, and maintaining the TQL support office. The TQL coordinator should receive proper education and training on TQL and should be respected by the top leader and others within the organization [Ref. 1: p. 45].

Quality advisors (QA) provide TQL training to the various teams as necessary. If required, they work with the team leaders to facilitate team functioning until the teams are operating smoothly. A statistician may also be required later to help perform organizational analyses, conduct statistical quality analyses, and provide statistical training and technical advice [Ref. 1: p. 46].

An Integrated Quality Improvement Team Structure

Strategic Quality Policy/Goals
What are our customers' needs?
What are our critical processes?
Do our processes meet customers' needs?
What changes are required for quality improvement?

Process Improvement
How does the process work?
Which process variables are most significant for quality?
How do we gather current performance data?
What resources are needed to analyze/improve the process?

Data Collection
What can we do to simplify the process?
What can we do to stabilize the process?
What did we learn from the data collected?
Are there special problems to be corrected?

ESC

QMBs

PATs

Direction and Resources

Data and Recommendations

Figure 6. An Integrated Quality Improvement Team Structure.

III. METHODOLOGY

This chapter is truly the heart of this thesis' outline [Ref. 27: p. 43]. It describes the methodology and research methods used in this thesis to collect data and conduct the required analysis to provide answers to the research questions. Section A outlines the general procedure designed by the researcher to meet the objectives of this thesis. The research techniques used to collect data are explained in Section B. Section C describes the methods of analysis used to draw conclusions from the data.

A.   DESIGN OF THE RESEARCH STUDY

The main objective of this thesis is to assess the TQL implementation process onboard a warship, specifically onboard the USS Carl Vinson, and from that experience, to evaluate the viability of application of that philosophy onboard Chilean warships. To evaluate the TQL implementation process onboard the USS Carl Vinson the researcher selected four parallel techniques. The first one consisted of a climate survey addressed to a randomly selected sample of the crew members and designed to assess to what degree each one of the Deming's Fourteen Points has been effectively adopted onboard the ship. The evaluation was based on the Deming's Fourteen Points because according to the DON: "Only when an organization can say it is practicing effectively all Fourteen Points is it truly practicing what the US Navy calls TQL." Thus the Fourteen Points provide a reference to assess the USS Carl Vinson's current status regarding TQL.

The second instrument used was a written questionnaire addressed to key members onboard the ship. Key members surveyed were the commanding officer (CO), five department heads, the TQL coordinator, and the senior enlisted advisor. The intent of these questionnaires was to gather the opinions, views and experiences of USS Carl Vinson's top leadership on the TQL implementation process onboard their ship. It was important for the researcher to know directly from these authorities their opinions as they have a more systemic focus about the TQL process as a whole.

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The third tool was to conduct personal interviews with the commanding officer and with the command TQL coordinator to understand in more detail their opinions about the TQL implementation process. The intention of the author was to include these interviews because they provide a higher level of richness of data from the two main TQL sources of information onboard the ship.

The last technique consisted of a review of TQL documentation available onboard the ship, including an in-depth review of two processes that have been effectively improved by using the TQL approach. The purpose of the document review was to gather the required information to reconstruct the TQL implementation process followed by the USS Carl Vinson. In addition, two in-depth processes improved by the TQL approach were included to show readers some specific outcomes of the new philosophy.

To assess the potential of TQL implementation onboard Chilean warships, another document review was conducted on Chilean Navy publications. The focus of this research effort was to identify the Chilean Navy culture, beliefs, norms, and values, and from this, to draw some conclusions about how well the TQL philosophy would fit in the Chilean warship environment. For this purpose, the experience of the author, twenty three years as a Chilean Naval Officer, has been used to complement information gathered from official documentation.

Data evaluation was conducted using statistical tools for the climate survey addressed to the crewmembers and qualitative techniques to evaluate the document review and the responses to the written questionnaires and personal interviews.

The survey for the crew and the selective questionnaire for top leaders were handed personally to the ship by the researcher. The package included a personal letter for the commanding officer and another letter for each person required to respond the survey or the questionnaire. The latter letter is contained in Appendix B. It would have been desirable to arrange personal interviews with selected top leaders but operational and time constraints precluded this approach. However, one personal interview was conducted by the researcher

with the commanding officer and many others with the TQL coordinator, in addition to their written questionnaires.

B.   RESEARCH INSTRUMENTS

1.   Crew Questionnaire

A written questionnaire addressed to a sample of the crew members was developed specifically for this study. Appendix C contains this questionnaire of eighty-two questions developed to assess Deming's Fourteen Points as they are being applied onboard the ship. Specifically, the researcher intended to determine how sailors understand TQL, how they act under TQL, and what the role of leadership is under the new philosophy. This self-administered questionnaire is considered an indirect media for gathering information [Ref. 11: p. 321]. The questions were formulated and arranged following general rules suggested in Chapter 11 of the same source; "Business Research Methods," Fifth Edition, written by Donald R. Cooper and C. William Emory, and were designed to reduce bias and increase validity of the answers, as well as to continuously awaken the respondent's interest in continuing the questionnaire. The most important design considerations were:

1. The questions reflecting the type of information required to accurately measure the crew's perception about the way the ship was addressing each of the Fourteen Points.

2. The questionnaire be easy to answer in order not to bore the surveyee [also see Ref. 33: p. 34], and

3. The questions be arranged in such a way that those answering the questionnaire did not know which question was associated with which of the Fourteen Points.

The survey to the crew was administered by the ship following researcher's written instructions. Fortunately, the TQL office onboard the ship has a lot of experience in administering surveys. In fact, the ship is continuously developing questionnaires for the crew in order to have feedback about the TQL implementation process. This prior experience also increases the validity of this questionnaire.

2. Selective Questionnaire for Top Leaders

Specific open-ended written questionnaires were developed to be responded to by USS Carl Vinson top leadership. Appendices D, E, F, and G contain the questionnaires for the commanding officer, the department heads, the TQL coordinator, and the senior enlisted advisor, respectively. The ship was asked to randomly select five department heads to respond the questionnaire. The following department heads responded: weapons, engineering, supply, administrative, and personnel. Questions were tailored to each addressee according to their position and involvement in the process. The respondents were asked to include full identification on the questionnaires. The executive officer, even though he has significant involvement in the TQL implementation process, was intentionally not included in order not to take too much time from all top leaders onboard the ship.

3. Strategic Interviews for the CO and the Command TQL Coordinator

In addition to the written questionnaires mentioned above, the author personally interviewed the CO and the Command TQL Coordinator in a more informal fashion with the purpose of exploring in a more interactive and flexible way their views and experiences about the transformation process being monitored and/or coordinated by them. The interviews touched pretty much on the same questions included in the written questionnaires but in a more comprehensive way. The main objective of these interviews was for the author to form a better picture about their motivation and enthusiasm concerning TQL, and assess how they see the transformation process for the future.

C. METHOD OF ANALYSIS

1. Selective Questionnaire for Top Leaders

Personal questionnaires addressed to top leadership were analyzed by grouping similar responses to provide the readers with the possibility of comparing opinions from different surveyees. This method also facilitated identification on areas of strong and weak consensus between the respondents. In addition, the responses were weighted differently depending on the amount of concrete data provided by the respondent. Therefore it was necessary for the researcher to gather additional information to support the initial assertions of those

respondents. If the assertion was not supported in terms of hard date, it was reflected in the conclusions drawn with regard to that issue. This is consistent with any quality management approach in the sense that the continuous process improvement should be conducted by using hard data to effectively support the decision making process.

2.   Crew Questionnaire

Crew members required to respond to the crew survey were asked to answer each question from among the following five choices: strongly agree, agree, undecided (or no opinion, not applicable, not understand), disagree, strongly disagree. To allow a numerical analysis, using a spreadsheet data base and its built-in statistical capabilities, the alternatives were associated with a numerical scale ranging from "1" (strongly agree) to "5" (strongly disagree). Most of the questions were addressed in a positive way; that is, a "Strongly Agree" meant a strong positive correlation with the specific point (of the Deming's Fourteen Points) associated with that question. However, some questions were written in a negative way; that is, a "Strongly Disagree" meant a strong positive correlation with that specific point. To reduce the likelihood of misleading the reader in the interpretation of the results, detailed in Appendix J, the results of questions written in the negative way were reverse scored. An average grade was obtained for each of the Deming's Fourteen Points by averaging responses to all the questions related to that point. As an example, a mean value of two (2) indicates that, on average, crew members agree that specific point is being effectively addressed by the ship, at least in crew members' perception. In other words, the ship has been successful in addressing that specific obligation of management. On the contrary, a mean value of four (4) indicates that in the opinion of crew members, leadership onboard the ship has been unsuccessful in addressing that specific point.

The assessment of the TQL implementation process from the crew questionnaire was measured not only by considering the mean value, but also by analyzing the standard deviation for each question. The greater the standard deviation the less reliable the question is for drawing valid conclusions as there is less consensus among the respondents. On the other hand, the smaller the standard deviation the more consistency in the opinion among crew

members thus the more reliable the conclusions drawn from that point. Obviously, the standard deviation was always computed by using the same data used to compute the average.

The sample size of 137 crewmembers was divided into 6 officers, 8 chief petty officers, 49 petty officers, and 74 enlisted personnel. The analysis also explored the possibility that various demographic groups, extracted from the sample, had a different perception on some specific aspects of the TQL implementation process. For that purpose, the sample was sub divided into groups following two different criteria: seniority and TQL experience/involvement. The first criteria was the "Seniority" of the surveyees and was computed as a weighting average of the rank (weighting factor=60%) and the time served in the Navy (weighting factor=40%). These weighting factors were arbitrarily assigned based on the belief that rank in the Navy is a slightly better indicative of seniority than the time served in the Navy. Following this procedure, the sample was broken down into: 48 "SENIORS," 33 "JUNIORS," and 56 "FRESHMEN." The cutoff for each group was naturally chosen after looking at the weighted average factors for this first criteria sorted in increasing order.

The second criterion was designed to capture the degree in which the surveyees had been trained or involved in any TQL course/role. It was computed as the weighting average of the number of courses taken on TQL (weighting factor=50%) and the number of TQL teams the surveyee had participated on (weighting factor=50%). These weighting factors were also arbitrarily assigned based on the assumption that both indicatives, number of hours spent in TQL formal training and number of TQL teams the individual had participated on, are equally relevant to the criteria. Under this criteria, the sample was broken down into: 39 "MORE EXPERIENCED," 44 "AVERAGE EXPERIENCED," and 54 "LESS EXPERIENCED." Here, again the cutoff for each group was naturally chosen after looking at the weighted average factors for this second criteria sorted in increasing order.

In general, the group of "seniors" is composed mainly by most officers and CPOs and about 30% of the PO. The group of "juniors" is composed by a few officers and CPOs, about 40% of the PO, and a few enlisted. The group of "freshmen" is composed mainly by 30% of

the CPO and most of the enlisted. Under the second criteria, the group of "high experienced" is composed mainly by people having participated in at least two TQL team or with an average of 30 hours of formal TQL training. The group of "moderate experience" is composed by people having participated in at least one TQL team or with an average of 20 hours of formal TQL training. The group of "low experienced" is composed mainly by people without any significant experience or formal training on TQL.

As a summary, Table 1 shows the six demographic groups, their size, and the weighted average range per group:

Table 1. Demographic Distribution of the Sample

	GROUP SIZE	WEIGHTED AVG RANGE PER GROUP (1)
SENIORS	48	1.0 - 2.2 (2)
JUNIORS	33	2.4 - 2.8 (2)
FRESHMEN	56	3.2 - 3.6 (2)
MORE TQL EXPERIENCE	39	1.0 - 2.0 (3)
AVG TQL EXPERIENCE	44	2.5 (3)
LESS TQL EXPERIENCE	54	3.0 (3)
TOTAL	137	

Notes:

(1)   The criteria used to define the groups was natural break points after sorting the population in increasing order of weighted average factor of "Seniority" for the first three groups, and weighted average factor of "TQL Experience/involvement" for the second three groups.

(2)   The weighted average for the first three demographic groups was computed by assigning the following numerical scale:
        Rank: 1 - Officer   2 - CPO 3 - PO   4 - Enlisted

        Time in the Navy: 1 - More than five years
                                         2 - Two to five years
                                         3 - Less than one year

(3)   The weighted average for the second three demographic groups was computed by assigning the following numerical scale:

Number of TQL teams: 1 - More than two teams
                            2 - One or two teams
                            3 - None

Hours of TQL formal training: 1 - More than 59 hours
                                 2 - One to 59 hours

3.   Chilean Warship Environment

The analysis to predict the fitness of the TQL implementation onboard Chilean warship environment was conducted in a less scientific way. The general procedure was to figure out how the Chilean Navy culture would integrate with a philosophy like TQL. To answer that question, the researcher extracted the main aspects of the Chilean Navy culture from official documentation enriched by his own experience. The main positive outcomes and barriers for TQL implementation onboard the USS Carl Vinson was analyzed under the perspective of the Chilean warship environment. The author is aware that the conclusions drawn from this kind of analysis are highly subjective. For that reason, the conclusions about the perspectives for potential use of the TQL philosophy onboard Chilean warships are related only to general aspects and need to be validated through further research efforts, some of which will be noted in Chapter VI.

The author also understands that his experience in the Chilean Navy played a primary role in this final part of the analysis. Thus, it is important for the reader to have knowledge about the researcher's experience in the Chilean Navy. The author has been in the Navy for 27 years: five at the Naval Academy as a cadet and the remaining twenty two as an officer. He has two primary specialties; Naval Mechanical Engineer obtained after three years of study at the Naval Engineering School in 1979 and a Master in Maritime War Sciences with mention in Logistics and Administration obtained after two years of study at the Chilean Naval War College in 1993. His experience afloat totals 10 years, all of them onboard surface ships of the Chilean Navy main fleet (i.e., cruisers, frigates, destroyers, and in the staff of the flag fleet). Apart from the time "spent" onboard and on the various courses taken during his

career, the author has also filled positions at the Chilean Naval Academy, as the Instruction Department Head, and at the Naval Engineering Directorate in two opportunities.

D. DRAWING CONCLUSIONS FROM THE ANALYSIS

This section describes how the conclusions obtained from the analysis were integrated to find answers to the research questions. The first point of this section discusses the methodology followed to provide answers to the questions related to the assessment of the TQL implementation process onboard the USS Carl Vinson. The second point establishes the procedure used to find answers to the research question related to the applicability of TQL in the Chilean warship environment.

1.   Assessment of TQL Implementation Process Onboard the USS Carl Vinson

The following are the research questions related to the assessment of the TQL implementation process onboard the USS Carl Vinson:

1. Is it possible to successfully implement TQL onboard a warship?

2. What are the main positive outcomes after implementing the TQL philosophy onboard the USS Carl Vinson?

3. What are the main obstacles in implementing TQL onboard the USS Carl Vinson?

To provide answers to these research questions, it was necessary to integrate the conclusions obtained from the analysis of each of the research techniques used to assess the TQL implementation process onboard the ship. That is, conclusions from the document review, the responses to the selective questionnaires addressed to top leadership, the responses to the crew questionnaire, and the in-depth analysis of two processes approached were compared and contrasted to develop a comprehensive picture of the USS Carl Vinson's TQL journey and to answer the above questions.

2. Applicability of TQL to the Chilean Warships

The following is the research question related to the applicability of TQL in the Chilean warship environment:

What are the main experiences from the TQL implementation process onboard the USS Carl Vinson for future applications in Chilean warships?

To provide answers to this research question it was necessary to use the main findings from the TQL experience onboard the USS Carl Vinson, analyze the Chilean Navy culture, the Chilean warship environment, and from those analyses draw conclusions as to the applicability of TQL in the Chilean warship environment. The outcome of this process is addressed in Chapter V.

IV. TQL ONBOARD THE USS CARL VINSON

A.   IMPLEMENTATION PLAN

1.   Background

The first efforts to implement TQL onboard the ship began in 1993 with the training of the top leadership and the TQL coordinator.   In October 1993, the original ESC established the first approach to the command's mission, vision and guiding principle's statement.   Then, the ESC chartered four QMB's to evaluate and improve processes considered by the ship as "low-hanging fruit." Unfortunately, the processes selected were too large and complex, and the charters too vague for the projects to be workable.   With this experience, the ship realized that the organization was too large to be managed by using the traditional quality improvement team structure suggested by the DON. In October 1994, the new commanding officer of the ship, Captain Larry C. Baucom, brought with him a distinctive new style of TQL implementation. He decided to spread down the responsibility of TQL implementation to the department level. In his view, shared by top leadership, it would be much more effective to consider each department as an organizational unit with their own Departmental Steering Committees (DSC) [Ref. 12: p. 12].

2.   Quality Improvement Team Structure

To meet its needs the ship customized the quality improvement team structure suggested by the DON. Each department was required to form its own quality team structure as if they were different organizations. In this way, each department created its own TQL structure headed by a DSC playing the role of the ESC in a smaller organization. For this structure to be effective the assumption is that one department provides for or manages most of the products and services for a specific customer.   Figure 7 depicts the USS Carl Vinson quality improvement team structure and differentiates it from the ship's standard organization [Ref. 12: p. 12]. The composition and specific roles of each team are described in the next paragraphs. In general, the ESC is responsible for overseeing the TQL implementation

process as a whole giving broad latitude to the department heads to implement TQL at their own pace.

USS CARL VINSON (CVN 70) TQL Organization

Executive Steering Committee

Department Steering Committees

Strategic Committees

Command TQL Coordinators

Quality Management Boards

Quality Management Boards

Gold Eagle TQL Team

Process Action Teams

Process Action Teams

Data Collection / Statistical Process Control
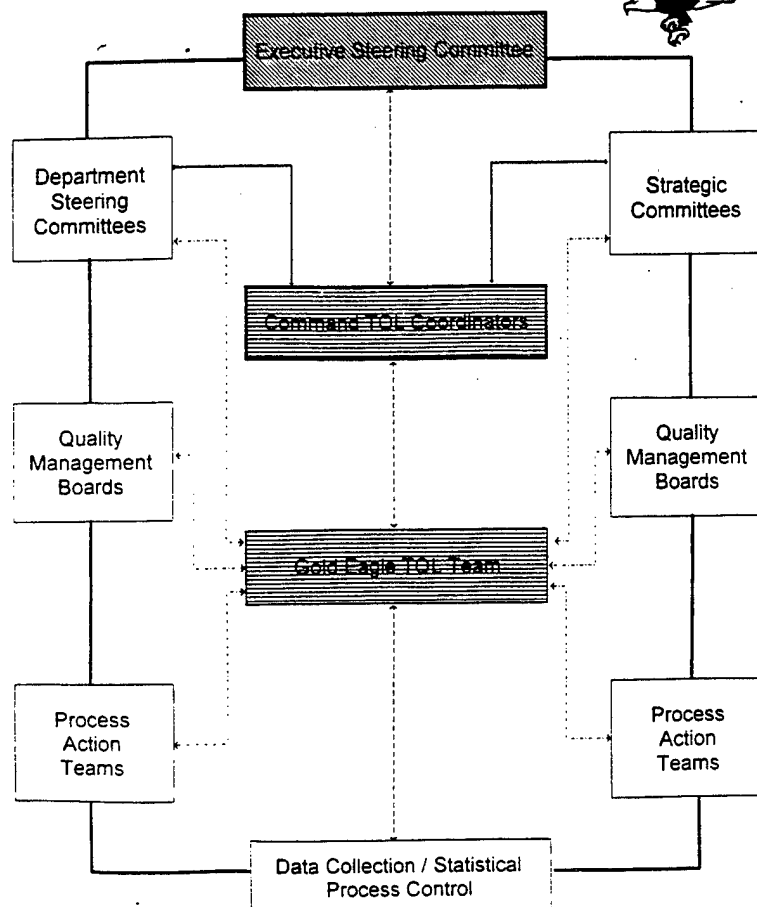
Figure 7. USS CARL VINSON Quality Improvement Team Structure.

At the department level, each DSC has the authority to charter QMB's as required. Similarly, the QMB's can also charter PAT's to deal with specific tasks in the process improvement effort. The QMB's and PAT's chartered by the DSC's are shown on the left-hand-side of the Figure 7. DSC's are composed of the departments' top leadership and chaired by the department head. The role of the DSC is analogous to the role played by the ESC's in smaller organizations. That is to develop the quality leadership philosophy, develop and monitor the departmental TQL implementation plan, identify key processes and charter QMB's as required, and provide resources and decision support for the department's TQL structure. Each department has a quality advisor (QA) who is a member of the Gold Eagle Team. The QA's primary responsibility is to provide TQL support and technical assistance within their own department.

The responsibility for coordination, integration, training, and support of the departmental efforts falls to the Command TQL Team (Gold Eagle TQL Team). Membership of this team is comprised of Departmental Quality Advisors, the Command TQL Coordinator who is the team's chairman, and all other interested personnel. Actually, this team is the central hub of the TQL implementation process. As shown in Figure 6 this team interacts with all other teams at the various levels, including the ESC. The primary role of this team is to capitalize on the TQL experience of the departments. The active participation of departmental QA's is crucial to this purpose. They serve as a bridge to interchange TQL experience among departments to the benefit the transformation process.

The ESC is composed of only a few department heads (those most related to the operational areas), the executive officer, and the senior enlisted advisor. It is chaired by the commanding officer. The ESC's focus is on areas that could improve materially the ship's ability to fight, issues affecting the crew as a whole, or cross-functional processes affecting products and/or services to external customers. In other words, the ESC's focus is only on strategic processes thus having a high power leverage when acting upon them. After identifying an area requiring improvement, the ESC charters a strategic committee to deal with that specific issue. This committee charters QMBs as required, and the QMBs charter

PATs as required. For example, the Environmental Action Strategic Committee chartered a QMB to deal with processes related with recycling the aluminum, oil, and other components generated onboard. The strategic committees and the QMBs are permanent. The PATs are temporary in nature and are chartered only for the required period of time to accomplish the specific tasks assigned by the respective QMB. The strategic committees, QMB's, and PAT's chartered by the ESC are shown on the right-hand-side of Figure 7.

The USS Carl Vinson Command TQL Coordinator reports directly to the commanding officer on all the issues related to the Gold Eagle TQL Team and the TQL implementation process. He also manages the TQL office and has responsibilities for technical support, training, and TQL documentation for the ship as a whole. The command TQL coordinator also supervises the formal TQL training program and provides technical guidance and support to the TQL instructors for continuously improving the quality of the instruction. As expected, the command TQL coordinator also deals with any TQL-related tasks which are beyond the scope of each department; such as preparing internal and external reports on TQL, maintaining continuous communication with the Coronado TQL School and other external organizations, and coordinating TQL efforts among departments.

3.   Implementation Plan Time line and Main Issues

As noted earlier, in 1994 the new commanding officer brought new ideas for overcoming the deficiencies experienced by the ship with her original TQL implementation process. After deliberation with the ESC, the ship decided to phase in a new TQL implementation plan as described below. Appendix H shows the TQL implementation plan time line as established by the ESC [Ref. 13: Encl. (1), pp. 2-4]. This plan covers the period since the current commanding officer took over (JAN 95) until starting the strategic planning process after (SEP 97).

1.   Phase I: Reorganization of the TQL Implementation Process. This phase covers the period beginning with the new commanding officer (JAN 95) until the date scheduled for deployment (JUN 96). The main events included in this phase are: (1) creation of the five strategic committees chartered by the ESC, which are mentioned later in section B; (2) rewriting of the ship's mission, vision, and guiding principles statements; (3) setting up onboard end-user TQL training

courses; (4) assigning responsibility of TQL implementation to department level; (5) starting strategic planning, and (6) starting the annual TQL survey. Most of the activity takes place in the first four months of 1995 with two activities going on forever (end-user courses and the five strategic committees). The purpose of this first phase was to reorganize the whole TQL implementation process onboard the ship and virtually start all over again, taking advantage of the experience gained during the false start period. The main lesson learned during the false start was that team charters were too broad and processes chosen were not mission critical nor manageable.

2. **Phase II, Assess and Refocus TQL Efforts**. This phase essentially covers the period since the issue and analysis of the first annual TQL survey (April 95) until the date scheduled for deployment (Jun.96). The purpose of this second phase is to assess current TQL status, mainly through the TQL survey, and to start applying the new TQL approach resulting from the assessment. The main events included in this phase are: (1) restructuring of TQL teams; (2) dissemination and training on the new TQL implementation plan; (3) starting departmental pilot projects; (4) incorporation of new TQL courses; (5) establishing connections with other organizations committed with the TQL philosophy, and (6) selecting and training TQL Coordinator replacement.

3. **Phase III, Wrap-up First Cycle and Deployment**. This phase covers the period beginning with the end of the ship's deployment cycle (APR 96) up to starting the strategic planning process after deployment (SEP 97). A deployment cycle is made up of a yard/availability period, a work up training period, and the deployment itself. The purpose of this third phase is to wrap up the deployment cycle, to capitalize on experience obtained during deployment, to use the results and experience to start with the new cycle and to begin the strategic planning process. The main events included in this phase are: (1) assessment of effectiveness of the first cycle; (2) TQL training and support activities during deployment; (3) assessment of the effects of TQL on deployment performance and plan for TQL implementation (adjustments) of next deployment cycle; and (4) beginning of the strategic planning process.

The TQL implementation plan, though not absent of several difficulties such as the relatively slow pace shown by some departments, is in general on schedule. The following explanations of the USS Carl Vinson TQL Implementation Plan (Appendix H) will be discussed more fully to emphasize issues having or expected to have a major effect on the

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transformation process according to the experience of the Command TQL Coordinator [Ref. 13: pp. 3-9].

1. <u>TQL Training Onboard</u>. The ship has its own TQL education and training program set up onboard. USS Carl Vinson provides TQL training at the level of end-user courses, in four separate, progressive courses: Introduction to TQL (3.5 hours); Fundamentals of TQL (30 hours); Team Skills and Concepts (30 hours); and Methods for Managing Quality (30 hours). Course coordinators are assigned for each course. They coordinate class scheduling, support issues, and instructor assignments. Instructors for the courses are drawn from all departments throughout the command, each receiving training via the DON TQL train-the-trainer courses. Under the new approach, top leadership strongly believes that training on TQL is one of the best ways to create the critical mass required to speed up the transformation process.

2. <u>New TQL Office</u>. The opening of a brand new TQL office onboard the ship has served those involved in the TQL effort in many ways. It has been set up to accommodate DSC and QMB meetings, watching TQL related videos, and Just-In-Time (JIT) lectures. The latter refers to very specific training demanded by a team/group to enable them to perform a specific TQL task. There is also a wide assortment of reference material available in a TQL library set up in this office.

3. <u>Publish and Conduct Training on the Implementation Plan</u>. To ensure that everyone is moving in the same direction, the implementation plan has been widely disseminated through officially written communication down to the chain of command, through an in-depth training to the departmental QA's, and through just in time training (JITT) held whenever possible to help spread the concept and reinforce key points of the plan. TQL committees and team meetings are good occasions to further explain the plan.

4. <u>Department Pilot Projects</u>. Each department was required to select and work on a pilot project. The selection was to conform to the following criteria: i) the project selected should be important to the department and cross-sectional among most of the divisions; ii) the process must be manageable and have a high probability of success; iii) the boundaries of the project must be clearly defined and understood by all members; and iv) look for an area with potential for the use of TQL tools and for measurement. The plan also suggests the department heads to start with the establishment of the department's mission, vision, and guiding principles before chartering any QMB or PAT.

5. Establish Connections with Other Organizations. The ship has been continuously interchanging TQL experience with other organizations within the Navy committed to the TQL philosophy. This communication consists mainly of letters, applications for the presidential quality award, and other types. One problem the ship is experiencing is that it has sent about fifty written communications up to date while receiving no more than seven from other organizations. The purpose of this activity is to take advantage of others' experience in the TQL transformation process and to help keep the ship from becoming incestuous about its TQL approach. Fresh inputs and new ideas from lessons learned at other organizations can keep the ship from getting tripped up in the same areas. The ship will also share its progress with others.

6. Assess Effectiveness of First Cycle of Implementation. Active committees, teams and boards continue with business as usual, making adjustments for the upcoming deployment as required. However, this change in operations presents the perfect time to assess efforts made to-date, to look for opportunities for data collection unique to deployments, and to begin thinking about how to do better during the next cycle. Hopefully, these efforts will pay dividends in the next deployment cycle.

7. Set up for Deployment End-user Training and JITT. End-user courses will be held during deployment as required by the users. The intention is to offer this courses in a flexible fashion; that is, to meet department requirements. The JITT lectures will continue as originally intended. The idea is to emerge from the deployment in very good shape to face the next deployment cycle.

8. Begin Strategic Planning Process. After deployment and with the assistance of the NAB Coronado Schoolhouse, the ship will begin work on the strategic planning process. A new commanding officer is due to arrive probably right after deployment and the turnover of many key positions on the ship at that time could be an excellent opportunity to begin work on that project.

B. TQL IMPLEMENTATION PROCESS

1. From Document Review

A document review was conducted onboard the ship and the results of the analysis were organized in various quality management related dimensions following a structure similar to the presidential quality award format [Ref. 25: pp. 8-22]. In fact, the ship applied for that award in 1996 but was eventually not selected by the DON. The four dimensions are: (1) leadership; (2) strategic planning; (3) human resources development and management; and

(4) process management and business results. In addition to the application for the 1996 presidential quality award, other documents were also reviewed such as the TQL implementation plan and various formal documents filed at the TQL office onboard the ship.

a. Leadership

The ship has established the following TQL related activities that show the effectiveness of top leaders commitment to TQL efforts [Ref. 12: pp. 1-5]:

1. During the familiarization and indoctrination course, the CO personally reads and discusses the Carl Vinson's mission, vision, and guiding principles with every new ship's member.

2. The ship holds weekly zone inspections through a team headed by the XO. The team is also integrated by the Damage Control Assistant and other ship's senior personnel. The scope of influence for these zone inspectors is vast; they provide feedback to all the departments and divisions on the ship, communicating their expectations and setting standards to increase the readiness of the 3,051 spaces throughout the ship. Though this procedure is common practice for the entire Navy, what is different under the new approach is the way the ship manages the information gathered during the inspections and the feedback provided to and from the department heads and crew members. The ship is not currently using TQL to address this issue, though TQL has contributed to improving two-way communication and the effectiveness of these periodic zone inspections.

3. The DSC model is another way of exercising leadership around the ship. Creating ship and departmental missions, visions, and guiding principles causes sailors to feel closer to the TQL implementation process. It has also provided TQL leadership positions for interested personnel. Appendix "I" shows the current USS Carl Vinson mission, vision, and guiding principles statement, and various departments' mission, vision, and guiding principles statements.

4. The Gold Eagle Team provides a forum wherein personnel discuss obstacles encountered in their TQL implementation efforts, specific support training needed for their departmental quality teams, and ideas for making the transition easier. Here, those personnel with the most training and experience meet to discuss ways that they can further support the ESC and each individual DSC. The departmental QA's provide a great deal of feedback and guidance to their respective departmental teams as well as the team leaders for those teams.

5. The CO regularly appears on closed circuit TV where enlisted personnel have the opportunity to voice their concerns related to the ongoing process, thus preventing decision making from becoming slow and ineffective. Department heads and division officers also allow enlisted personnel under their command to have an open forum through informal meetings. These opportunities for the crew to express their concerns have been useful for gathering information which is then worked on within the strategic committee chartered by the ESC to deal with the quality of life of the crew onboard the ship.

b. *Strategic Planning*

The following are the main activities initiated to improve the strategic planning process [Ref. 12: pp. 8-10]:

1. The ship created a unique approach to strategy development that allowed the ESC to concentrate on those processes that are more important for the ship as a whole while leaving the DSC's to manage and improve internal processes supporting the ship's operational goals. Apart from generating the command's mission, vision, and guiding principles, the ESC has chartered five strategic committees (QMB's) to address areas considered to have a large impact upon the crew as a whole or upon the fighting capabilities of the ship. The five strategic committees and a brief description of their purpose follow:

   - The Carl Vinson Information Systems Committee. Chartered to define a vision of the information systems required on board and to put into place the equipment and infrastructure to support that vision.

   - The Environmental Action Team. Chartered to provide oversight and leadership for improving all Carl Vinson programs and processes that impact the environment.

   - The Joint Air Force Air Component Commander (JFACC) Support Team. A working group of selected Carl Vinson and Air Wing Fourteen personnel chartered to provide a vision of CVN-70's and CVW-14's ability to house, support, and man the JFACC should such duties be activated onboard.

   - The Home Port Change Committee. Chartered to analyze in advance all the potential issues related to the impending home port change to Bremerton, Washington, especially those affecting the ship's personnel welfare including their families.

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- The Learning Resource Center (LRC) Committee. Chartered to investigate and to make plans for a prototype LRC that meets crew members' needs. The project includes a multimedia center with installed softwares, the incorporation of Navy-related educational material and Navy graduate and postgraduate education opportunities into the local area network, and long-distance education available through recognized civilian educational institutions and provided by computer-based learning programs.

2. The TQL Implementation Plan is considered a living document and is updated and revised as required and as new information surfaces. It covers all aspects of the quality transformation, including the delineation of steps involved in strategic planning at both the ESC and DSC levels. In fact, the plan is now in its fourth iteration and, when written in June 95, extended out for a period of eighteen months. A major factor affecting the implementation plan is the deployment cycle (i.e., a yard/availability period, a work up training period, and the deployment itself) in the sense that sometimes is hard to coordinate TQL activities with operational demands, especially when the ship is subjected to formal inspections. Implementation planning has been improved through trial and error, through incorporation of training provided by the Coronado schoolhouse, through feedback from instructors and students in the ship's TQL training program, and from experience gained by the Gold Eagle TQL Team. The ship expects to begin strategic planning with DON strategic planning facilitators in late 96 or early 97.

3. The alignment of short and long term operations with strategic direction takes place largely on the department level through the department's vision statement and goals. As a matter of fact, departmental mission and vision statements are aligned with the command's mission and vision. Since the departments retain responsibility for control and improvement of the huge amount of products and services that each of them provides, the key business drivers are determined and monitored there, as is the case with the five strategic committees chartered so far by the ESC.

c. *Human Resource (HR) Development and Management*

The following are the main points addressed by the ship to improve HR development and management [Ref. 12: pp. 11-16]:

1. Changes in attitudes and command atmosphere and a general shift toward teamwork and lateral communication foster more and rapid communication,

flexibility, and innovation. According to the ship, the creation of the parallel organization, that is the TQL structure, has helped to facilitate this transformation.

2. Various personal achievement medals for teamwork granted as opposed to only awarding them for individual efforts. Individual departments and divisions have created additional special awards for teamwork and for generating suggestions and/or ideas as in the operation department's peer recognition program and quality achievement award.

3. There are increasing opportunities for personnel to learn and use skills that go beyond current job assignments through the redesign of processes or organizations. For example, Administration Department's reorganization included cross training with the Supply Department/Disbursing to better facilitate improvements in customer service.

4. The leadership and guidance provided by the CO, XO and the department heads, combined with the support and training provided by the Gold Eagle TQL Team has caused the team concept to spread throughout the command so rapidly that it is impossible to track all the teams operating at the various levels. Actually, the TQL organizational structure has become integrated into the way business is conducted onboard the ship. Even teams not officially chartered have been influenced by TQL implementation and the constant emphasis on standards and expectations.

5. The TQL courses provided by the ship consider many interesting and some innovative methods to improve the quality of the instruction. Classes consist of presentations, videos, classroom exercises, discussions, and required reading. Facilitators are supported during the times they are providing instruction by having another facilitator present at the back of the room to critique or assist when necessary. Students are provided with all necessary materials including a student guide to take notes in and use as a future reference. The following table shows an updated summary of the percentages of personnel who have passed TQL training courses onboard the ship as of March 1996:

	Fund	T.S.	MMQ
CPO and Officers	55%	27%	16%
E-6 & Below	15%	3%	1%

Abbreviations: Fund - Fundamentals of TQL
                              T.S.   - Team Skills and Concepts
                              MMQ - Methods for Managing Quality

6.   The primary mechanism that the ship uses to ensure a safe and healthful work environment is its zone inspection process. Comments from distinguished visitors have been consistently positive concerning the cleanliness and material condition of the ship. The author had also the opportunity to personally verify this after completing an informal tour throughout the ship. On the other hand, the Safety Department publishes a monthly report listing accidents and injuries that have occurred during the previous month and the corresponding man-hours lost. This information provides the command with a regular assessment of the effectiveness of training and education on safety related issues as well as indications of trends in the material condition of the ship. The ship is initiating the process to collect data and to use control charts for monitoring processes involved in safety issues.

7.   Because the ship is not only a warship, but is also considered the home of its personnel, there are many opportunities to make life aboard more enjoyable. Senior leadership has kept quality of life issues a priority, no matter the ship's schedule. Many of the improvements and ideas have been brought up and/or worked on during the ESC meetings, expediting changes that are considered acceptable. One of the most innovative measures is the effective support that the LRC will provide to the onboard PACE program (Afloat Education). The ship has three professors currently on board, providing college courses at the freshman and sophomore levels to interested personnel. The same professors also provide functional skills courses to those personnel desiring to improve their skills in math, English or reading preparation for future college courses. The LRC, being developed by one of the TQL strategic committees, is expected to connect the ship with a variety of colleges and universities to have available for the crew fresh information regarding academic programs and library resources.

d.   *Process Management and Business Results*

The following are the main aspects addressed by the ship [Ref. 12: pp. 17-22]:

1.   The USS Carl Vinson has created or redesigned some new products or services using the TQL approach. However, the ship has not yet reached the level of control and improvement of processes through statistical process control nor has

it focused on designing new products and services. In this sense, the most important efforts and results are the following:

- Administration Department. Using TQL the ship created a unique, effective and responsive Administration Department and Personnel Office. Some interesting and effective ideas that have been put into practice during this reorganization are: i) the concept of one-stop service for all personnel (previously officers had to retrieve their service records from one office and go to another to execute forms, etc.); ii) a self-help counter where customers can fill out forms to prepare for the transactions they wish to make; iii) a dedicated customer service representative that assists and directs customers, performing no other jobs; iv) the ability to communicate through the electronic mail or by sending a form through the departmental administrative representative; v) a production section dedicated to one-on-one customer service handling the typing of forms and computer entries; and vi) a research and analysis section to handle requests for information.

- Weapons Department. G-2 Division, determined that improvements were required in the construction of the underway portable small arms range that they built originally. Using the TQL philosophy, a team of interested personnel came together to brainstorm ideas for improvements to the range. Many ideas were generated, tested and installed over the next few months. Improvements generated money savings from not having to pay for a bus to drive personnel to the shore range. This coupled with the increased number of personnel qualified when the ship is underway would make it a valuable asset to any ship. The division is currently at work preparing a proposal to submit through the Military Cash awards Program, any proceeds earned going to division personnel.

- The ship's Legal Office now has worldwide communication ability with Naval Legal Service Offices (NLSO's), Senior Judge Advocate (SJA) Offices, and the Office of the Judge Advocate General (OJAG) Headquarters via the Navy's JAGNET system. This ability was achieved through the use of a modem, software, and NLSO-West's server. No other aircraft carrier in the Pacific Fleet has this ability. The ship can now send E-mail messages, legal documents, and legal opinions immediately when needed, thus saving time and money. Personnel in the office conceptualized and created this set up from the ground up.

- The Hostage/Crisis Negotiations Team was created after realizing that, once the carrier deploys, waiting on assistance from shore would not allow for a timely and effective response to handle prisoners or hostages onboard. The

program hinges on the existence of personnel who have received specific training in this area. The command has supported the team existence by providing funding for basic training and there are now four qualified negotiators on board with plans to expand that number prior to the next deployment.

- Supply Department/Damage Control (DC) Division. It was found that DC work and maintenance, the responsibility of the many individual divisions within the supply department, was not being performed consistently throughout the department. Supply Department stood up a DC Division, providing all the necessary tools, manpower and support to enable it to function properly. The results are clear: damage control work and maintenance have improved tremendously. The author personally checked the excellent level of presentation and maintenance of part of the DC material through two in-depth visits to various spaces around the ship.

2. The ship has two good examples of forays into supplier relation management:

- The best example is the weekly production meetings created and run by the Engineering Department. Representatives from the ship meet with contractor personnel on a regular basis to communicate difficulties encountered and possible solutions to current and past problems. Feedback from the meetings has been consistently positive; schedules have become much more flexible as each has been made aware of the others' requirements and jobs have been completed faster and more efficiently than previously. Data is at this time being recorded to establish a baseline from which the ship could judge the future progress of this team. No data is available in usable form at this time.

- The ship started the installation of a bar-code/I.D. scanning system. A team was formed in March 95 to look at the possibility of building a system from scratch or purchasing one from a company who now has one in use on another aircraft carrier. After evaluating what this company had to offer and producing a cost/benefit analysis on the end-product resulting from the process of building a system from scratch, it was determined that the best decision was to purchase a ready-made system. Through meetings and negotiations with the company that provides the equipment, modifications are to be included in the system that the ship purchases, potentially alleviating problems that the other aircraft carrier is now experiencing.

3. The ship has begun employing data collection methods at various points around the command. Examples from the ongoing efforts are discussed here.

- Part of the physical security of the ship includes employing armed guards at the entrances to the ship. These guards must qualify at least annually on the weapons that they carry. G-2 Division manages the program for qualifying a pool of approximately 200 personnel and has employed run charts, in the interest of improving the process. As division personnel monitored the results of the individual qualification firings, they learned enough about the process to make some adjustments, resulting in both improvement and stabilization. The charts maintained by this division have been in use since January 94. The process is now being transferred to control charts for monitoring. This process is further explained in section 4 of this chapter.

- Personnel Division, using TQL tools and methodology, organized a major restructuring of their office complex to improve customer service. Data collection efforts began on April 95 and focused on the daily throughput of customers in each of six separate sections. Each section maintains a run chart every day and the results of all sections are collected and organized by the division's Master Chief. Run charts and bar graphs are used to depict the results. To-date the data has been used to determine choke points in service and the extent to which the operational schedule affects the time spent with the customers. This process is also explained in more detail in section 4 of this chapter.

- Supply Department and its many divisions are fertile ground for data collection and process control and improvement. Stock control is but one example of the use of data that has been collected and sent off elsewhere. This same data is now being placed on run charts in the continuous effort to make the processes both stable and capable. Figures 8 and 9 show how is the ship tracking gross and net effectiveness in responding to material demands through the period Oct. 95 to Mar. 96. For Figure 9, Net Effectiveness is the ability of the ship to meet material demands for items that are normally stocked onboard the ship (fill customer orders) from material stocked onboard the ship. In other words, does the ship have the material it is supposed to have on the shelf when the customer asks for it. That is:

Demands Issued = Net Effectiveness (%)
Demands Carried
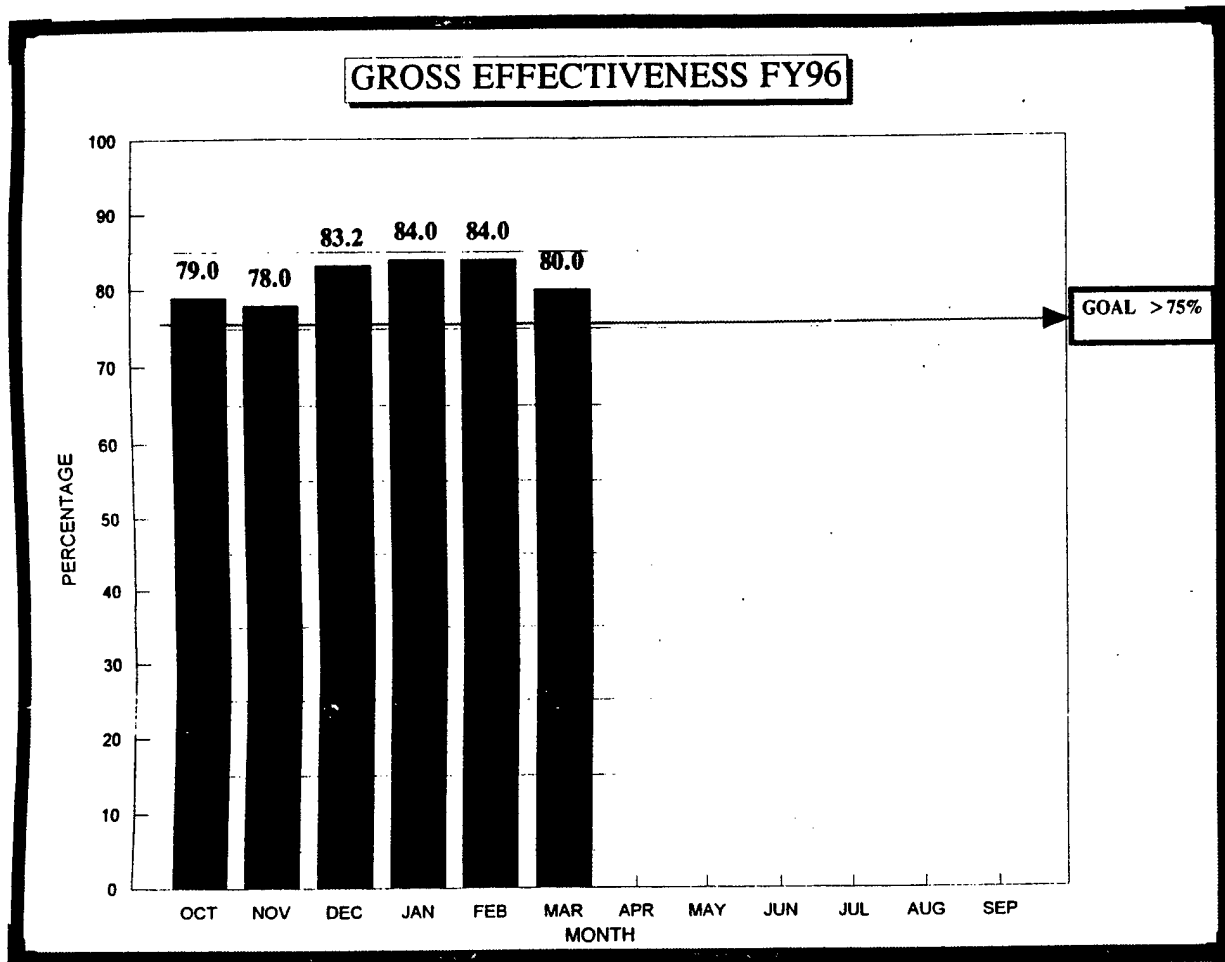
Figure 8. Material Demand - Gross Effectiveness.
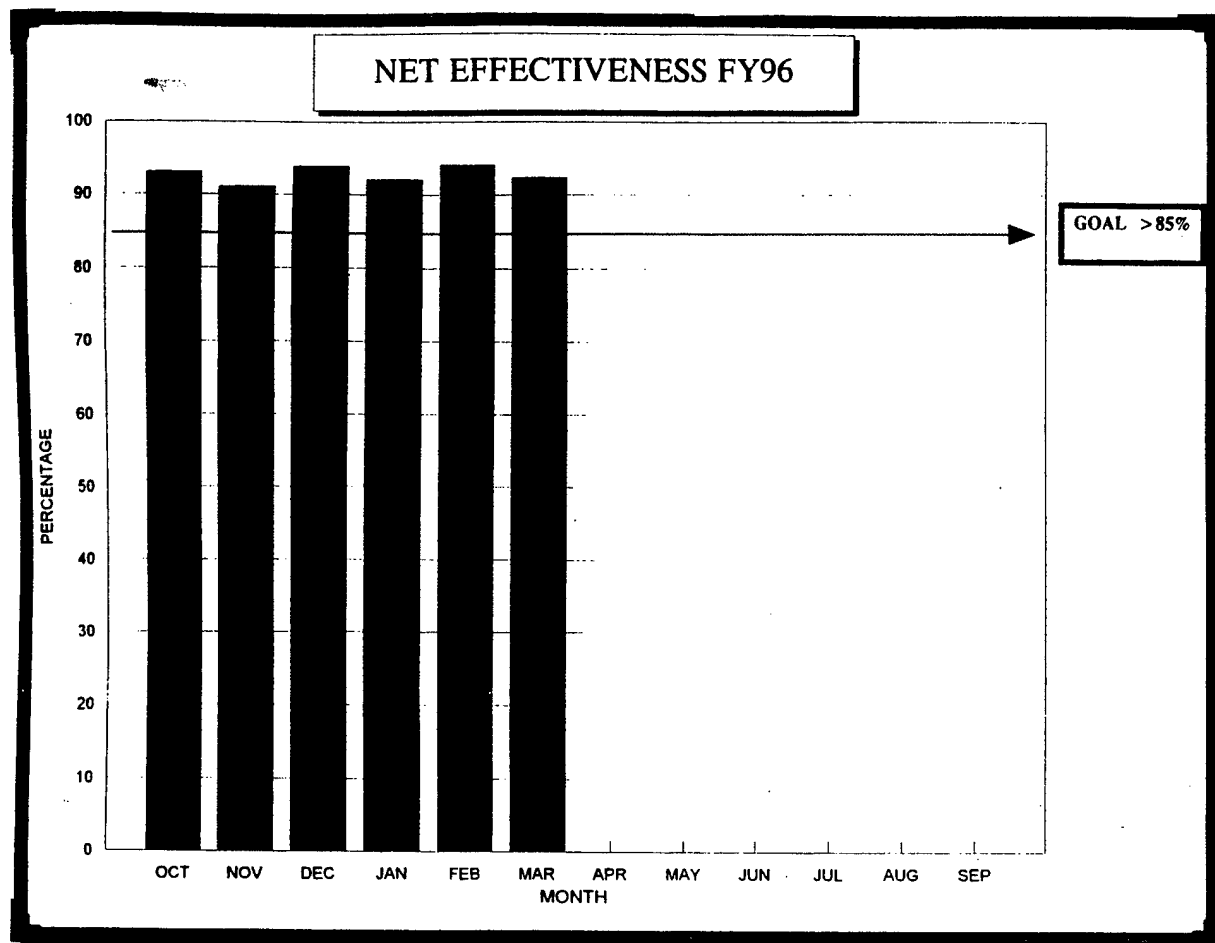
Figure 9. Material Demand - Net Effectiveness.

On the other hand, for Figure 8, Gross Effectiveness is the ability of a ship to meet material demands for all items requested by the customers regardless of whether the item is normally stocked onboard the ship or not. This measures how well the system learns from customers. The first time a customer asks for a particular item the system may not stock that item, but it should determine at that time if there will be a future need for the requested item and decide whether

or not to stock the item. If the system is learning from its customers and making good stocking determinations, the gross effectiveness should remain high. That is:

$$\frac{\text{Demands Issued}}{\text{Total Demands Received}} \quad = \quad \text{Gross Effectiveness (\%)}$$

In reality, the ship has always tracked these measures, but in the past without applying any systematic approach to bring the process under control. From 1995 the ship has been collecting data charting the process and making improvements, which have kept them continuously within their goal.

2. Selective Questionnaires from Top Leaders

This section includes a summary grouped by topic of the responses to the open-ended questionnaires, completed by the commanding officer, five department heads, the TQL coordinator, and the senior enlisted advisor. These questionnaires are shown in Appendixes D, E, F, and G, respectively.

a. TQL Acceptance

Some of the department heads recognize that TQL was met with skepticism at first. However, as more people were trained and even more were actually involved using it, acceptance grew. They added that as more people are becoming involved in developing improvements and are experiencing positive results, enthusiasm is gaining. Other department heads say that at least at the Officer level the acceptance is very good. They recognize that the process is in its "infancy," and that basic training is a primary goal. They also accept that a cultural change has taken place in the last 12 months. Another officer believes his department acceptance will increase as personnel get more involved in QMBs and PATs.

The commanding officer recognizes that more technically oriented departments (i.e., Reactor Department), which are well structured and procedure conscience, are reluctant to change tried and true methods. Others like Supply and Administration departments see results more readily and accept TQL easily. On the other hand, in opinion of the Command TQL Coordinator the differences among departments in terms of their commitment to TQL

are mainly due to the department heads. If the department head supports TQL then the remainder of the department will move in that direction. In addition, governing instructions and regulations also account for some differences in TQL acceptance among departments. For example, it is very difficult for an outsider to help members of the reactor department find processes to work on. They must comply with many external and very specific regulations that are difficult for an outsider to deal with.

b. Barriers to TQL Implementation

Four of five department heads agree that one of the main barriers is the ignorance and lack of training in TQL, especially among senior personnel. They also agree that just in time training and active participation in TQL are excellent ways to overcome this problem. Some of them think that another important barrier relates to lack of understanding of TQL methodology and the perception that TQL could mean additional meetings, reports, and paperwork that will consume valuable time. The "cure" for this problem, in their opinion, is to encourage subordinates to utilize TQL methods as a way of doing business and not worry about the formal reporting of projects.

Other barriers mentioned by the department heads are frequent turnover of personnel and resistance from senior enlisted personnel who view TQL as just another "program to be endured." Some ways to overcome these barriers are continuous training, especially for new personnel, and further changes and adjustment in command climate.

The commanding officer also concedes that a main barrier is the lack of training of senior (E-7 and above) personnel. To mitigate that problem he suggests to make training mandatory and make it available to avoid the excuse that senior leaders are "too busy" to get trained. Slow, cook book approach taught by Navy schools is a barrier due to the large turnover experienced by operational warship. In turn, train them quick and continuously onboard.

On the other hand, the command TQL coordinator believes that operational commitments have been an obstacle for TQL implementation in the sense that it is difficult to step back and take an objective look at things when in the middle of fighting a war, even

if it is only a training scenario. He thinks that formal inspections also have been an obstacle for TQL in the sense that they force many people to return to the "firefighting" mode of management instead of looking at continuous improvement of processes. In addition, a competitive atmosphere surfaces occasionally due to the interest of some of the department heads to excel without thinking of the ship's goals as a whole produces some suboptimization. The high turnover rate of personnel is also a barrier to TQL implementation, he concluded.

c. TQL and the Chain of Command

All department heads agree that TQL does not interfere with the chain of command. On the contrary, they believe that it strengths the chain of command by establishing more critical and nonthreatening two-way communication. People take responsibility for the parts of the organization that they are involved in and provide better feedback to leaders allowing them to make better decisions. However, some of them believe that there still are personnel in their department that do think that TQL negatively affects the chain of command.

The commanding officer believes that TQL has helped to strengthen the chain of command by improving communication and focus on processes and customers. Infighting and competition among departments greatly reduced. In opinion of the senior enlisted advisor, TQL has also strengthened the chain of command through two way communication.

d. Morale and Discipline of the Crew

All of the department heads concur that TQL has improved morale and discipline of their personnel. In their experience, when people know that leaders believe and trust them and are also willing to listen, morale goes up. Discipline is better since all personnel understand the value and necessity of pulling together as a team. They apply peer pressure to ensure the success of each division and work center. In the commanding officer's opinion, morale has increased and discipline problems and cases have dropped with TQL. Shipmates are looking out for each other. To support this assertion, the ship uses a red tag, sorted by division, to provide a rough indication of the number of discipline cases they experienced in the last months. The number of those red tags has diminished dramatically since TQL

implementation though no hard data is available in a meaningful way to support this assertion. The senior enlisted advisor also believes that morale and discipline of the crew have improved with TQL as a result of focusing on process knowledge.

e. Cooperation Among Departments

The commanding officer believes that cooperation has greatly increased with TQL and that departments are willing to sacrifice for the common good of the whole ship. Communication is better. The senior enlisted advisor concurs that cooperation among crew members has improved through varied personnel from different departments striving for improvement of a single process, working toward a common goal. Though there is no objective data to support this assertion, it seems evident from the various discussions performed by the author with the command TQL coordinator.

f. Examples of Some Specific Processes Being Improved Under TQL

This question was addressed only to the department heads with the purpose of presenting some examples of processes being improved by using TQL tools. The specific procedures used to improve these processes are not fully explained in this section. However, later on in this chapter there are two processes improved under TQL that are explained in much more detail.

In the dental department, TQL has been used to improve the "front desk check in process." Even though this is still an ongoing program, TQL has made a difference in reducing waiting time, and speeding up the check in process. In fact, average waiting time for patients dropped from 15 to 10 minutes using recommendations suggested by the PAT members.

In the administration department, TQL has improved customer service in the personnel office. After analyzing the process through teamwork, the telephone and typewriter were removed from the office so technicians could focus on serving customers without juggling different forms of service at expense of delaying service to the customer. This, in turn, improved timeliness and accuracy of processing customer transactions. Customers experienced less aggravation and time away from work centers. The department also added

later on in this chapter as it is part of a more comprehensive process named "Administrative Services."

The AIMD (Aviation Intermediate Maintenance Department) first focused on providing better customer service to the embarked carrier air wing fourteen. A survey was issued to all nine squadrons, requesting responses from personnel who made the last deployment. Using preliminary survey feedback, the department initiated customer service meetings while at sea, expanded the scope of the technical publications' library, reduced the number of rejected maintenance actions, uncovered significant automatic test equipment and aircraft avionic configuration control discrepancies and in general enhanced the level of communication between squadron maintenance control personnel and production control.

In the engineering department, the most prominent success story has been the process of Ship's Force Work Requests, work accomplished by the engineering department shops for the various divisions on the ship. In July 1995, very little work was being accomplished by these shops outside the department in comparison with actual capabilities. There was an informal work request and tracking process and virtually no feedback to customers at the management level on what was getting done. There was no effective way of measuring the utilization of technicians' time. The department head was personally receiving numerous complaints from senior managers that work was being requested over and over again and not getting accomplished in a timely fashion. Through teamwork, the department developed and then implemented a process of requesting, tracking, and reporting the status of this type of work. After approximately four months the program has proved to be highly successful. The shops are showing an approximate 300 % increase in the number of jobs they are accomplishing and the complaints about long term lack of job completion have decreased from several daily to about one every two weeks.

g. Other Responses from the Commanding Officer

When asked about the effect of TQL on the ship's readiness, the CO responded that by focusing on processes involved in training, maintenance, and operation the ship has been able to be more effective at achieving milestones and training goals with fewer days at

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sea. He also added that communication and involvement at all levels have created a higher morale and sense of ownership and pride.

Relating to the contribution of TQL to formal inspections, the CO said that programs stay healthy using TQL techniques. Inspections become easy and are a chance to "show off." Discrepancies are used to improve processes.

When asked about personal feedback procedures used to assess advances on the TQL implementation plan he responded that the main feedback is through periodic departmental progress reports collected by the Command TQL Coordinator. In relation to the effect the implementation plan has had on the budget, he responded that TQL somewhat has affected the budget of the ship, especially to afford expenses to get started with training and materials. However, compared with total ship budget it is not too much. Anyway, he believes that it's worth the effort in comparison to benefits.

He also responded that his expectations for the TQL implementation plan for the near future are a slow and controlled expansion in the transformation process, a greater sense of ownership by crew at all levels, and fun and satisfaction for everybody in making things better.

When asked to share some prior TQL experiences he said that Navy leaders tried to force implementation on his prior ship by implementing a TQL structure, spending lots of time and money on training and expecting immediate results through monthly reports from ship to the Atlantic Fleet Commander. As a result, the ship did not operate well, leaders were spending too much time in meetings. Morale was low and TQL became an unpopular acronym. Also, immediate operational commanders were not trained, did not believe in philosophy, and became a barrier to implementation.

Finally, the CO was asked to make some recommendations for implementing TQL in other navies. In his response he emphasized to train top levels of Navy first to let them see benefits. Then progress down the chain of command to operational units. Make training of the entire fleet a priority prior to expecting instantaneous results. Let unit commanders proceed using their own initiative. Attempt to make use of fundamental

principles as a way of life rather than another program. Only then will you see positive results, he concluded.

h. Other Responses from the Command TQL Coordinator

When asked how he felt in the position as TQL Coordinator, he said he felt absolutely comfortable. He added that due to the commitment and support provided by the CO, the XO, and the ESC he has been able to keep the implementation process active. He said that even though at times it is difficult for a junior officer (LT JG) to act as advisor to department heads at the CDR and CAPT level, this is largely a matter of the leaders' personality. In his opinion, this ship (USS Carl Vinson) has been fortunate in that the overwhelming majority of department heads have been team players. He added that while lack of individual exposure or training may slow implementation in an individual department, all senior leaders have made an effort to contribute to the overall command atmosphere of cooperation and continuous improvement.

He defined his role as a "coordinator." There is so much to attend to that any TQL coordinator is unable to be involved in all of it. The TQL coordinator coordinates, organizes, supports, and advises. He believes that the most effective method for coordinating the implementation effort is to simply walk around and talk to people.

Finally, he said that some of the outcomes are a positive and improving attitude exhibited by the crew, improved material condition of the ship, and acceptance of ideas resulting in numerous quality of life improvements throughout the ship. As was said before, the author is a personal witness of the high level of cleanliness exhibited by most of the spaces visited in various tours around the ship.

i. Other Responses from the Senior Enlisted Advisor

He said that as a senior advisor leader his main role is to be an advisor of the CO, the XO, and the department heads and that TQL formalized those roles via the ESC. When asked about the TQL crew members general acceptance, he said that he believed that TQL has been very well accepted by the crew members. Moreover, they feel enthusiastic with this new philosophy, he concluded.

3.   From Survey to Crew Members

The climate survey for the crew members consisted of a questionnaire made up of eighty-two questions related to the Deming's Fourteen Points. The purpose of conducting this questionnaire was to assess, from the crew's point of view, to what extent is the ship successfully addressing each one of the fourteen obligations for management. A total of 137 crew members from the various departments completed the survey, representing approximately 4% of the USS Carl Vinson total crew. As was fully explained in Chapter III, the respondents were asked to answer each question from among the following choices: strongly agree=1, agree=2, undecided=3, disagree=4, and strongly disagree=5. Thus, if a mean value of the responses to any question is 2.5, that means that the perception of that specific group, as an average, is somewhere in between an "undecided" position and an "agree" position, say, they are in a "weak agree" position, with regard to the assertion implied in the question.

The sample size of 137 crewmembers (6 officers, 8 chief petty officers, 49 petty officers, and 74 enlisted personnel) was broken out into six different demographic groups according to two dimensions; seniority and TQL experience/training. The criteria for coming up with those six groups was fully explained in Chapter III, Section D. The following table, explained in Chapter III (Table 1), shows a summary of the six demographic groups, their size, and the weighted average range per group:

	GROUP SIZE	WEIGHTED AVG RANGE PER GROUP (1)
SENIORS	48	1.0 - 2.2 (2)
JUNIORS	33	2.4 - 2.8 (2)
FRESHMEN	56	3.2 - 3.6 (2)
MORE TQL EXPERIENCE	39	1.0 - 2.0 (3)
AVG TQL EXPERIENCE	44	2.5 (3)
LESS TQL EXPERIENCE	54	3.0 (3)
TOTAL	137	

Computations and numerical analysis for each question were done on a spreadsheet, and are contained in Appendix J. In general, the mean value is a measure of what the respondents think as an average about a specific topic. The standard deviation is a measure of the dispersion of the opinions about the same point. For example, from Appendix J, the evaluation for question number 24 (from summary tables for Deming's point #5) for the less experienced demographic group is: Mean=3.04 and Standard Deviation=1.26, and for the more experienced group is: Mean=2.67 and Standard Deviation=1.11. The conclusion would be, as 2.67 is less than 3.04, that as an average, those with more TQL experience believe that leadership is starting to pay more attention to the long range results in comparison with those with less TQL experience. In addition, the dispersion in the responses was also less in the group with more experience, as 1.11 is less than 1.26, meaning that among that group there is more agreement in their perception.

The author decided that for this analysis, a mean value less than three constitutes a positive assessment for the issue addressed by that specific question. Conversely, a mean value greater than three constitutes a negative assessment. This reference value was determined according to the distribution of the mean values over the whole sample. Tables 2 through 15 summarize the responses to the crew questionnaire.

Point #1. Create and publish to all the crew a statement of the aims and purposes of the organization. The management must demonstrate constantly their commitment to this statement.

Table 2. Summary of Point #1.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	1.92	0.91
JUNIORS (33)	2.27	1.09
FRESHMEN (56)	2.09	1.02
MORE TQL EXP. (39)	1.92	1.02
AVG TQL EXP. (44)	2.07	0.98
LESS TQL EXP. (54)	2.28	1.01
SUMMARY (137)	2.07	1.01

This point, with an average of 2.07, is ranked in the first place among all the Fourteen Points when considered over the whole sample. This implies the ship is doing well in focusing on long-range results, sailors have a better understanding of their duties and how they contribute to the aim of the ship/department, and the ship is paying more attention to identifying and better serve customers. One of the issues that has positively contributed to this point is the continuous effort in TQL training and the preparation and dissemination of the ship and department missions, visions, and guiding principles. In fact, most of the surveyees responded that they have a clear idea of what the ship's mission is (question 38, average 1.77 and standard deviation 0.95) and how their daily work contributes to the goals of their department (question 9, average 1.91 and standard deviation 0.99). Responses also indicate that leadership usually appreciates and values sailors' efforts in maintaining the equipment under their responsibility in good shape (question 1, average 2.01 and standard deviation 0.95). The worst aspect related to this point is that in sailors' perception, there still are some difficulties acquiring the required training to get the job done under changes in

technology and positions within the department (question 13, average 2.57 and standard deviation 1.12).

Point #2.   Learn the new philosophy, top management and everybody.

Table 3. Summary of Point #2.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.62	1.27
JUNIORS (33)	2.70	1.24
FRESHMEN (56)	2.59	1.26
MORE TQL EXP. (39)	2.67	1.32
AVG TQL EXP. (44)	2.59	1.22
LESS TQL EXP. (54)	2.63	1.25
SUMMARY (137)	2.62	1.26

This point, with an average of 2.62, is ranked in sixth place among all the Fourteen Points when considered over the whole sample. This means that crew members have a relatively good understanding of the new philosophy. They are starting to change the traditional way of doing business and accepting that they must adopt quality as the ultimate aim. Under the new approach, the crew is starting to pay more attention to the processes to reduce waste and looking for alternative ways to improve them. This is a clear demonstration that the efforts put in TQL training are giving valuable returns. In fact, most of the surveyees responded that their approach is to prevent mistakes during the work execution rather than after completion of the task (question 3, average 1.93 and standard deviation 0.93). They also recognize that at least in their department they are committed to better use the resources assigned to them to get the job done (question 27, average 2.26 and standard deviation 0.96). However, contrary to Deming's philosophy, many of them still believe that formal inspections

are the best way to ensure that everything is operating correctly (question 5, average 3.59 and standard deviation 1.26).

> Point #3. Understand the purpose of inspections, for improvement of processes and reduction of cost.

Table 4. Summary of Point #3.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.93	1.24
JUNIORS (33)	3.19	1.40
FRESHMEN (56)	3.13	1.30
MORE TQL EXP. (39)	3.12	1.35
AVG TQL EXP. (44)	2.95	1.25
LESS TQL EXP. (54)	3.14	1.32
SUMMARY (137)	3.07	1.31

This point, with an average of 3.07, is ranked in the twelfth place among all the Fourteen Points when considered over the whole sample. The overall assessment for this point is not as good as expected. This means that, on average, crew members are rather undecided in their perception of how the ship is designing, planning and using the results of various inspections to improve processes and reduce costs. There is still a tendency to trust in formal inspections as the best way to improve results instead of looking at processes. The other issue that arises from the data is difficulty in properly using the data gathered through the inspections. The relatively low grade in this point also may reflect the lack of knowledge and training in some basic statistics tools, especially those designed to identify special and common causes of variation. In fact, two questions accounted for the higher mean score for this point. Sailors still feel that leadership blames them for mistakes rather than examining the process (question 7, average 3.93 and standard deviation 1.01) and they recognize that data

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is readily available in the workplace but nobody is really interested in collecting it or does not how to use it to improve quality (question 8, average 3.35 and standard deviation 1.15). The positive side is that many of them recognize that sailors and supervisors do have at least some authority to take action by introducing changes in the process in pursuing quality improvement (question 6, average 2.12 and standard deviation 1.12).

Point #4.   End the practice of awarding business on the basis of price tag alone.

Table 5. Summary of Point #4.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	3.06	1.30
JUNIORS (33)	3.23	1.20
FRESHMEN (56)	3.03	1.16
MORE TQL EXP. (39)	3.22	1.33
AVG TQL EXP. (44)	3.02	1.18
LESS TQL EXP. (54)	3.04	1.17
SUMMARY (137)	3.09	1.22

This point, with an average of 3.09, is ranked thirteenth among all the Fourteen Points when considered over the whole sample. On average, crew members are undecided about whether the ship is effectively addressing this point. This means that they believe there is still a tendency to buy on the basis of the lowest initial cost rather than the lowest total cost. The other issue involved here is the necessity of improving the relationship between suppliers and customers at the various levels. In the case of internal suppliers this could mean the need to implement regular channels of feedback and internal communication. In fact, most sailors agree that they work with so many suppliers that is difficult to build a long-term relationship based on trust with most of them (question 12, average 3.61 and standard deviation 1.11). In addition, though there is less consensus, many believe that those who work on procurement

tend to buy at the lowest cost regardless of the quality requirements (question 10, average 3.29 and standard deviation 1.23). Moreover, they somewhat believe that buyers do not clearly understand what they need in terms of quality when requesting material be purchased (question 44, average 2.73 and standard deviation 1.10). Two main reasons may account for these results: external suppliers are not necessarily involved in any quality management process and the ship has to comply with various regulations in the procurement area that are not necessarily aligned with TQL.

Point #5.   Improve constantly and forever the system of production and service.

Table 6. Summary of Point #5.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.69	1.14
JUNIORS (33)	2.97	1.23
FRESHMEN (56)	2.66	1.23
MORE TQL EXP. (39)	2.76	1.20
AVG TQL EXP. (44)	2.73	1.15
LESS TQL EXP. (54)	2.96	1.23
SUMMARY (137)	2.83	1.20

This point, with an average of 2.83, is ranked in ninth place among all the Fourteen Points when considered over the whole sample. This means that, on average, crew members are fairly undecided in their perception on how deeply the ship is committed to reduce variation in improving processes. Crew members understand the necessity of focusing on reducing process variation to improve quality. However, the lack of knowledge in how to manage basic concepts using statistics prevent them from effectively using the concept in practice. To some extent, this result could mean that leaders are not putting enough attention

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in constantly and forever improving the system under their control. Sailors in general believe that leadership is aware of the necessity of improving performance of equipment but they are reluctant to push the requirement up the chain of command (question 16, average 3.28 and standard deviation 1.12). For this last question, the high average of 3.28 could be also explained by the fact that sailors actually do not believe that leadership is aware of the necessity of improving performance of equipment. Sailors do recognize that they can get significant improvements by reviewing the process or procedures they regularly use to perform their job (question 14, average 2.50 and standard deviation 1.29). However, the high standard deviation implies less agreement. A very positive aspect is that many sailors, especially the youngest, believe that leadership is starting to pay more attention to long range results judging by their actions (question 54, average 2.59 and standard deviation 1.09).

Point #6.   Institute training (for skills).

Table 7. Summary of Point #6.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.47	1.13
JUNIORS (33)	2.63	1.20
FRESHMEN (56)	2.48	1.13
MORE TQL EXP. (39)	2.44	1.17
AVG TQL EXP. (44)	2.57	1.14
LESS TQL EXP. (54)	2.51	1.12
SUMMARY (137)	2.51	1.14

This point, with an average of 2.51, is ranked fifth among all the Fourteen Points when considered over the whole sample. This means that, on average, crew members feel they are given the opportunity to be effectively trained to understand and perform their job

in a proper fashion. This training includes the ability of sailors to improve the process in which they work. Specific questions reveal that sailors understand the concept of customers and are able to identify them (question 33, average 2.00, standard deviation 0.99). They believe they are properly trained to get their job done (question 22, average 2.12 and standard deviation 1.02). Moreover, they agree that leadership is concerned in ensuring that they are properly trained to do their job (question 78, average 2.47 and standard deviation 0.96). However, they are rather undecided about whether they are being regularly rotated to different jobs in order to increase cross training in performing various activities (question 57, average 2.91 and standard deviation 1.24). The responses indicate that sailors are also rather undecided in understanding the meaning of their work (question 19, average 2.66 and standard deviation 1.17).

Point #7. Teach and institute leadership.

Table 8. Summary of Point #7.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.45	1.15
JUNIORS (33)	2.54	1.08
FRESHMEN (56)	2.44	1.20
MORE TQL EXP. (39)	2.56	1.15
AVG TQL EXP. (44)	2.48	1.10
LESS TQL EXP. (54)	2.39	1.20
SUMMARY (137)	2.47	1.15

This point, with an average of 2.47, is ranked in the third place among all the Fourteen Points when considered over the whole sample. This means that, as an average, crew members see leadership onboard more as a coach and counselor rather than as a judge. Leadership understands the necessity of change to produce improvements. In addition,

responses indicate that sailors feel they have available the required tools and equipment for getting the job done effectively most of the time (question 50, average 2.26 and standard deviation 0.96). They also recognize that the supervisors usually do share experiences with them in order to facilitate their jobs (question 26, average 2.28 and standard deviation 1.05). This means that leadership understands the job of their subordinates or at least are interested in sharing learning experiences on how to perform the job better. However, younger sailors still feel that sometimes supervisors direct them to do something without having a good understanding of the overall idea behind their instructions (question 28, "juniors" and "freshmen"). Responses, especially among the youngest, confirm that sailors perceive supervisors as a coach, helping them to perform a better job (question 25, average 2.39 and standard deviation 1.19).

Point #8.   Drive out fear. Create trust. Create a climate for innovation.

Table 9. Summary of Point #8.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.34	1.04
JUNIORS (33)	2.65	1.23
FRESHMEN (56)	2.56	1.22
MORE TQL EXP. (39)	2.57	1.24
AVG TQL EXP. (44)	2.37	1.05
LESS TQL EXP. (54)	2.57	1.20
SUMMARY (137)	2.50	1.17

This point, with an average of 2.50, is ranked fourth among the Fourteen Points when considered over the whole sample. The data in Table 9 shows that, on average, fear is not a significant barrier to TQL implementation onboard the ship. Responses indicate that sailors, especially the youngest, agree that they can tell most problems to their supervisors and they

are reasonably sure that most of the time supervisors will be willing to help them in finding sound solutions (question 52, average 2.25 and standard deviation 0.63). They also feel free, though in less agreement, to pass even bad news up the chain of command and they have confidence that their superiors will react properly (question 31, average 2.43 and standard deviation 1.23). Moreover, sailors feel that supervisors are continuously interested in collecting useful information and recommendations from the floor and they use them effectively to improve processes (question 32, average 2.55 and standard deviation 1.12). The most controversial response, in which opinions are divided, is in sailors' perception of whether they are adequately rewarded for making process improvements in the workplace (question 36, average 2.74 and standard deviation 1.11). Overall, responses for this point are favorable for the ship in the sense that leadership has been able to create an atmosphere of mutual trust and freedom to communicate the good as well as the bad news through the chain of command.

Point #9. Optimize toward the aims and purposes of the ship the efforts of teams and groups.

Table 10. Summary of Point #9.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.87	1.14
JUNIORS (33)	3.06	1.17
FRESHMEN (56)	2.89	1.17
MORE TQL EXP. (39)	2.95	1.22
AVG TQL EXP. (44)	2.99	1.14
LESS TQL EXP. (54)	2.85	1.14
SUMMARY (137)	2.92	1.16

This point, with an average of 2.92, ranked tenth among the Fourteen Points when considered over the whole sample. This means that, on average, sailors perceive that the efforts of various cross functional teams and groups set up onboard could be coordinated better to accomplish their tasks and effectively meet their goals. Specific responses indicate that sailors are in considerable agreement that, even though everybody is doing a good job, the problem is a lack of coordination to effectively tie together those efforts (question 42, average 3.42 and standard deviation 0.62). In addition, they feel, though in less agreement, that everybody wants to be a super star in the job but the problem is that most of them do not care about doing the right things for the benefit of the department or the ship as a whole (question 63, average 3.42 and standard deviation 1.12). However, respondents think that leadership is usually encouraging the creation of teams whenever they judge them useful to improve processes (question 37, average 2.50 and standard deviation 1.07). The interpretation is that the ship, especially leadership, is starting to rely on cross functional teams to solve problems, even though it still appears there are some actions that interfere with optimization of team efforts.

Point #10. Eliminate exhortations for the work force.

Table 11. Summary of Point #10.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	3.34	1.07
JUNIORS (33)	3.35	1.17
FRESHMEN (56)	3.45	1.12
MORE TQL EXP. (39)	3.38	1.17
AVG TQL EXP. (44)	3.39	1.03
LESS TQL EXP. (54)	3.40	1.14
SUMMARY (137)	3.39	1.11

This point, with an average of 3.39, ranked last among the Fourteen Points when considered over the whole sample. Sailors feel that exhortations exhibited throughout the ship and/or slogans repeated by supervisors are not helping them perform better. Responses indicate that sailors think that leadership repeatedly asks them to "take pride in their work." (Question 49, average 3.66, and standard deviation 1.18). They also do not like slogans spread throughout the ship; they feel that those slogans do not help them to perform a better job (question 45, average 3.33, and standard deviation 1.10). The responses about this point demonstrate, as expected, that slogans can be demotivating if not wisely managed; sailors could misinterpret them as a signal that they are not putting all their effort toward doing their best and cannot provide specific help for them to effectively perform better. This last point seems especially true for the group with lower rank/time in the Navy (question 47 for the "freshmen," average 3.29, and standard deviation 1.00).

Point #11. Eliminate numerical quotas and management by objective (MBO). Instead, learn and institute methods for improvement and learn the capabilities of processes and how to improve them.

Table 12. Summary of Point #11.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	3.01	1.13
JUNIORS (33)	2.96	1.03
FRESHMEN (56)	3.12	1.18
MORE TQL EXP. (39)	3.02	1.16
AVG TQL EXP. (44)	3.02	1.06
LESS TQL EXP. (54)	3.09	1.16
SUMMARY (137)	3.05	1.13

This point, with an average of 3.05, ranked eleventh among the Fourteen Points when considered over the whole sample. On average, sailors have a slightly negative perception

on leadership's use of numerical targets for the work force in relation with process improvement. Responses indicate that in sailors' perception, especially among the youngest and those with more experience in TQL, leadership still believes that they do need numerical quotas to stay motivated (question 58, average 3.36 and standard deviation 1.05). Responses also confirm that sailors believe that leadership relies mainly on data to ensure that they are accomplishing targets in performing their job because this approach is easier than listening excuses for not meeting those targets (question 55, average 3.23 and standard deviation 1.02). On the positive side sailors somewhat believe that supervisors usually set targets by first considering the capabilities and limitations of the process (question 56, average 2.52 and standard deviation 0.99). On the other hand, opinions are rather divided on their perception of whether those targets or objectives have been designed in such a way that puts them in competition with other shipmates. Responses indicate that youngest sailors have a rather negative perception in that respect (question 65, average 3.07 and standard deviation 1.16).

Point #12.   Remove barriers that rob people of pride of workmanship.

Table 13. Summary of Point #12.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.79	1.15
JUNIORS (33)	2.99	1.22
FRESHMEN (56)	2.73	1.19
MORE TQL EXP. (39)	2.88	1.25
AVG TQL EXP. (44)	2.88	1.12
LESS TQL EXP. (54)	2.72	1.19
SUMMARY (137)	2.82	1.19

This point, with an average of 2.82, ranked eighth among the Fourteen Points when considered over the whole sample. This means that, on average, sailors perceive few significant barriers that prevent them from performing better. There is a consensus that supervisors and division officers understand sailors' jobs and processes they conduct on a daily basis (questions 68 and 70, average 2.34 and 2.10, respectively). However, there is less consensus that the performance appraisal system does reduce barriers and does foster cooperation among shipmates toward doing a better job (question 72, average 2.78 and standard deviation 1.16). Moreover, responses also indicate that in the freshmen's perception, supervisors use specific procedures to evaluate performance that contributes to creating additional barriers to performing better (question 69, average 3.23 and standard deviation 1.01 for the youngest group). Some of the crew believe that one of the main barriers to doing a better job is simply not having the required time and other resources readily available (question 62, average 3.07 and standard deviation 1.14).

Point #13. Encourage education and self-improvement for everyone.

Table 14. Summary of Point #13

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.22	1.09
JUNIORS (33)	2.50	1.16
FRESHMEN (56)	2.18	1.11
MORE TQL EXP. (39)	2.32	1.17
AVG TQL EXP. (44)	2.25	1.04
LESS TQL EXP. (54)	2.26	1.14
SUMMARY (137)	2.27	1.12

This point, with an average of 2.27, ranked second among the Fourteen Points when considered over the whole sample. In the sailors' perception leadership is starting to pay

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more attention to educating the work force to be better prepared to deal with process improvement, including the appearance of new technologies. Sailors agree that the alternatives provided by the ship to improve the educational level of the crew are easy to use and attainable for most people (question 75, average 2.45 and standard deviation 1.06). In fact, they also agree that supervisors, in general, are willing to provide them with the required time to use any of the alternatives provided by the ship to improve their education (question 82, average 2.37 and standard deviation 1.18). Moreover, they also agree that leadership is continuously encouraging them to take advantage of opportunities for improving their educational level (question 74, average 2.20 and standard deviation 1.12). The most important thing is that sailors do recognize that the ship provides them with many opportunities to improve their educational level (question 73, average 2.07 and standard deviation 1.09). Overall, the results on this point clearly indicate that all the effort put by the ship in providing alternative resources for the crew to improve their educational level is having important returns, by judging sailors' responses to the questionnaire.

Point #14.   Take action to accomplish the transformation.

Table 15. Summary of Point #14.

	AVERAGE	STANDARD DEVIATION
SENIORS (48)	2.77	1.13
JUNIORS (33)	2.92	1.17
FRESHMEN (56)	2.67	1.18
MORE TQL EXP. (39)	2.78	1.22
AVG TQL EXP. (44)	2.85	1.15
LESS TQL EXP. (54)	2.69	1.14
SUMMARY (137)	2.77	1.17

This point, with an average of 2.77, ranked seventh among the Fourteen Points when considered over the whole sample. On average, sailors feel that leadership is wisely managing the transformation process to ensure success of the TQL implementation plan. Sailors agree that they have witnessed the use of TQL to successfully improve a process onboard (question 81, average 2.64 and standard deviation 1.16). They also have a favorable perception, especially the freshmen, toward identifying themselves with the ship's commitment to undergo a quality management transformation (question 79, average 2.63 and standard deviation 1.03). However, others are undecided in their belief that the focus on quality is just one more program that will fade away like many others in the past (question 61, average 3.07 and standard deviation 1.25). Moreover, there is an important group, those who have an average experience or involvement in TQL, that believe that the only ones really interested on the new approach are leadership; they also believe that leadership wants to make the transformation by themselves, without too much involvement of the crew members (question 48, average 3.24 and standard deviation 1.19). However, overall sailors agree that the chain of command is committed to quality improvement (question 76, average 2.43 and standard deviation 1.06), and also recognize that sooner or later they will be also involved in the transformation (question 77, average 2.58 and standard deviation 1.10).

Summary of the Fourteen Points Assessment.

To provide the reader with a general picture of the results of the assessment according to the responses to the crew questionnaires, Table 16 summarizes the mean values and standard deviations of each of the Deming's Fourteen Points organized in increasing order of mean value.

Table 16. Summary of the Responses to the Crew Questionnaires.

		AVG	STD. DEV.
POINT #1	CREATE AND PUBLISH A STATEMENT OF THE AIMS AND PURPOSES OF THE ORGANIZATION	2.07	1.01
POINT #13	ENCOURAGE EDUCATION AND SELF IMPROVEMENT FOR EVERYONE	2.27	1.12
POINT #7	TEACH AND INSTITUTE LEADERSHIP	2.47	1.15
POINT #8	DRIVE OUT FEAR	2.50	1.17
POINT #6	INSTITUTE TRAINING FOR SKILLS	2.51	1.14
POINT #2	LEARN THE NEW PHILOSOPHY	2.62	1.26
POINT #14	TAKE ACTION TO ACCOMPLISH THE TRANSFORMATION	2.77	1.17
POINT #12	REMOVE BARRIERS THAT ROB PEOPLE OF PRIDE OF WORKMANSHIP	2.82	1.19
POINT #5	IMPROVE CONSTANTLY AND FOREVER THE SYSTEM OF PRODUCTION AND SERVICE	2.83	1.20
POINT #9	OPTIMIZE TOWARD THE AIMS AND PURPOSES OF THE SHIP THE EFFORTS OF TEAMS AND GROUPS	2.92	1.16
POINT #11	ELIMINATE NUMERICAL QUOTAS AND M.B.O.	3.05	1.13
POINT #3	UNDERSTAND THE PURPOSE OF INSPECTIONS FOR IMPROVEMENT OF PROCESSES	3.07	1.31
POINT #4	END THE PRACTICE OF AWARDING BUSINESS ON THE BASIS OF PRICE TAG ALONE	3.09	1.22
POINT #10	ELIMINATE EXHORTATIONS FOR THE WORK FORCE	3.39	1.11
SUMMARY		2.74	0.36

4. Two Processes Approached Under the TQL Philosophy

The purpose of this section is to describe in detail two processes onboard the USS Carl Vinson that were improved using the TQL philosophy. The two processes reviewed were selected by the Command TQL Coordinator. The first is related to customer service improvements in administrative services onboard the ship. The second process used TQL to improve the weapons qualifications program. The Navy Process Improvement Flow Chart,

shown in Figure 10, will be used to document what occurred during these process improvements [Ref. 14: p. 2].

a. Customer Satisfaction of Administrative Services

In mid-1993 a team comprised of personnel from the Personnel, Administration, and Disbursement offices, including personnel from pay grades E-3 through O-5, was assembled to discuss and plan a major reorganization of spaces and services. In October 1993 a survey of over 2,100 crew members was conducted to determine customer perceptions and satisfaction levels concerning current services. The team then apply TQL tools to improve processes involved. As a result, a proposal with supporting documentation was then assembled and delivered up the chain of command for approval. The package was approved, an exception being that certain items remained to be ironed out between the two departments involved, pertaining mostly to legalities and regulations. This is still in progress; the consolidation and reorganization of the Administrative Department side of the proposal continued, however. The majority of the reorganization was completed in mid-1994.

In April 1994 another large survey was conducted to determine customer satisfaction with the new system. The survey is still being used, now on a random basis with individual customers, to provide constantly updated customer feedback. Also in April 1994 data collection efforts began to establish baseline figures for the amount of time that customers spent in each section and how many customers were seen on any given day. The ship now has is unique, effective and responsive Administration Department and Personnel Office, with parts of the reorganization plan, modified and updated, still being put into place [Ref. 12: p. 18].

NAVY PROCESS IMPROVEMENT FLOW CHART
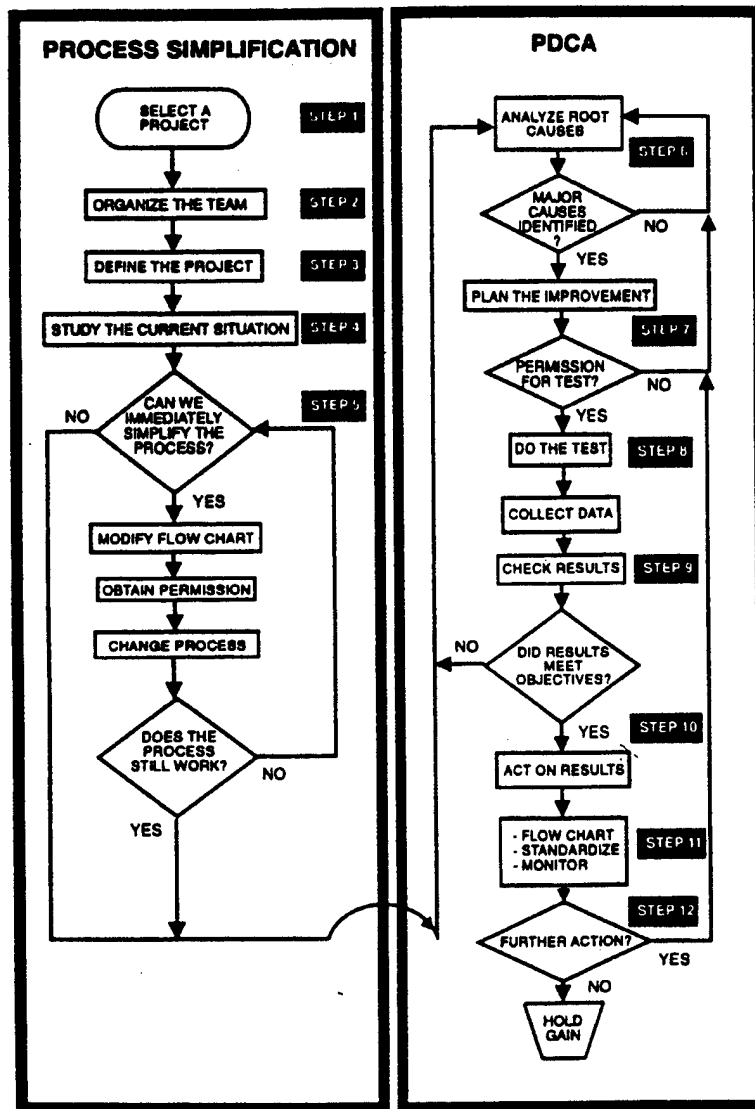
Figure 10. U.S. Navy Process Improvement Flow Chart.

Some interesting and effective ideas that have been put into practice during this reorganization are the concept of one-stop service for all personnel; a self-help counter where customers can fill out forms to prepare for the transactions they wish to make; a dedicated customer service counter that assists and directs customers, performing no other jobs; the

ability to have your work done over electronic mail or by sending a form through your departmental administrative representative; a production section dedicated to one-on-one customer service handling the typing of forms and computer entries; and a research and analysis section to handle requests for information.

The following paragraphs provide details on how the process improvement was conducted:

(1) Administrative services - process simplification.

STEP 1 - SELECTION OF THE PROJECT

Pay and Personnel "technicians" were tasked with "juggling" at the same time face-to-face customer service, typing pay and personnel impactive data and responding to incessant phone inquiries. This caused the process to become unnecessarily stressful, disorganized, labor intensive, and prone to errors and delays. Since personnel office technicians had to first type pay documents then pass it to the disbursing office for further processing, duplicate pay and personnel impactive data entry resulted. Additionally, officers were serviced in one office while enlisted were serviced in another. Low customer service satisfaction levels resulted. For this reason the Administration Officer (LCDR Findley) selected the project. The Administration Department DSC then confirmed the selection upon creation of the new TQL team structure onboard the ship.

STEP 2 - ORGANIZE THE TEAM

The Administration Department's DSC chartered a PAT which had representation from all pay grade segments of the Disbursing, Personnel, and Admin. Offices (E-3 to E-8; DKs, YNs, PNs, Admin. (O4), Supply (O5), and Personnel Officers (O3)). High levels of enthusiasm were maintained during the planning by allowing all segments of the Pay/Personnel/Admin workforce to contribute their ideas. This was key to the planning in order to develop the workforce's confidence, elicit enthusiasm to create a better way of conducting pay and personnel business, and avoid workforce resistance to change.

STEP 3 - DEFINE THE PROJECT

The objective was to provide one stop shopping for officer and enlisted crewmembers, minimize the typically hectic working conditions in the administration, personnel, and disbursing offices, and limit the amount of time a crewmember spends away from their work center to conduct pay and personnel related business. To

achieve these objectives certain measures were set which included minimizing time spent with a customer, limiting the number of pay and personnel workforce tasked with servicing customers in person or by telephone, and eliminating redundancies in the work flow. The results expected included improvements in timeliness and accuracy of pay and personnel support and improved confidence by crewmembers of services provided.

STEP 4 - STUDY THE CURRENT SITUATION

The pay and personnel support process onboard USS Carl Vinson seemed unnecessarily labor intensive and prone to errors and delays. The PAT found the reason for this was not because pay and personnel "technicians" were not knowledgeable, but that the process the ship employed was cumbersome, outmoded, inefficient, and highly stressful for the technicians as well as the customers. Carl Vinson's Personnel, Administrative, and Disbursing Offices collect pay and personnel data independently and manually prepare transactions for the Disbursing Office. Disbursing Clerks reenter the same manually prepared data into Uniform Microcomputer Disbursing System (UMIDS). The Personnelmen and Yeomen did not have access to UMIDS. The duplicate data entry allows for untimeliness and inaccuracy of pay data input. Additionally, the PAT found the Customer Service Counter in the Personnel and Disbursing Offices were serving customers while "juggling" incessant telephone inquiries and typing documents leave in. This led to inaccurate and "lost" pay and personnel transaction processing. Another finding was that the current process was time consuming for the customer. They had to wait in line and visit two locations to conduct pay and personnel business (Disbursing and Personnel). A backlog of customers was being created when one customer had a time consuming transaction. With the current process, customers had to spend time away from their work center or during meal hours to conduct business. Many of the transactions required return trips to complete action on their request (e.g., record of emergency data update requires customers to complete the rough, then return in 48 hours, wait in line again to sign the smooth document (if ready for a signature)). Figures 11 and 12 show a pie chart summarizing the time spent by customer service section and a lay out of the personnel office, before the reorganization, respectively.

USS CARL VINSON (CVN 70)

DOCUMENT
PREPARATION
35%

CUSTOMER SERV
COUNTER
22%

TELEPHONE INQUIRY
18%

ID CARD PROCESSING
20%

MILITARY REQUIREMENTS
5%
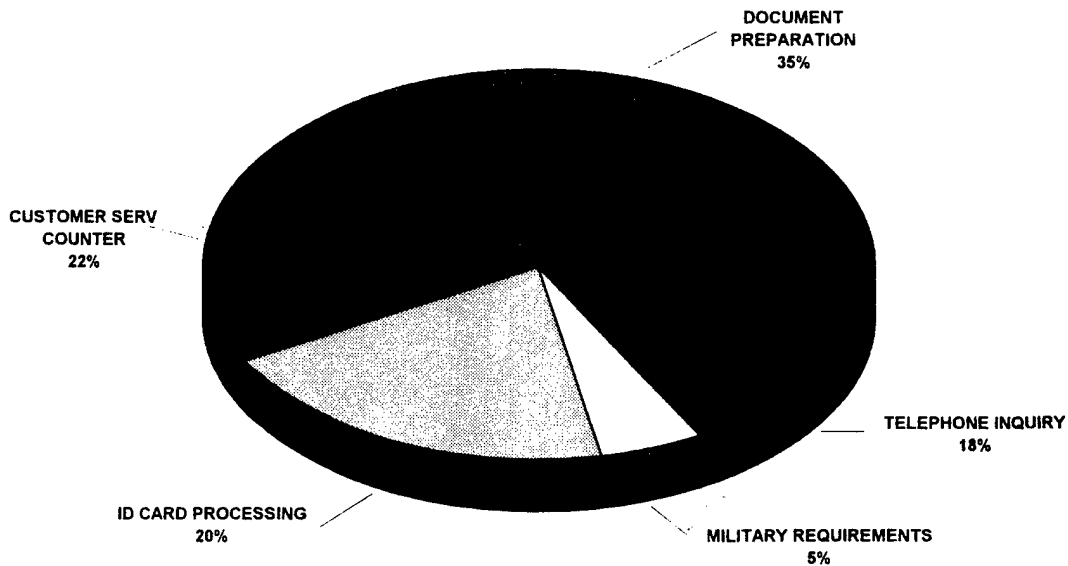
USS CARL VINSON (CVN 70)
DUTIES IN CUSTOMER SERVICE SECTION BEFORE CONSOLIDATION

TASK		DESCRIPTION
Customer Service Counter Inquiries	22%	Customer turns in forms for processing. Answers routine personnel inquires.
Document Preparation	35%	Typing research. verify eligibility, contact customer to return for signature(s).
Phone Inquiries	18%	Follow up by customer on transactions(s), etc.
ID Card Processing	20%	Part of Customer Service operation.
Military Requirement	5%	GMT and in-rate training, meetings, quarters.

Figure 11. Time Spent by Customer Service Section Before Reorganization.

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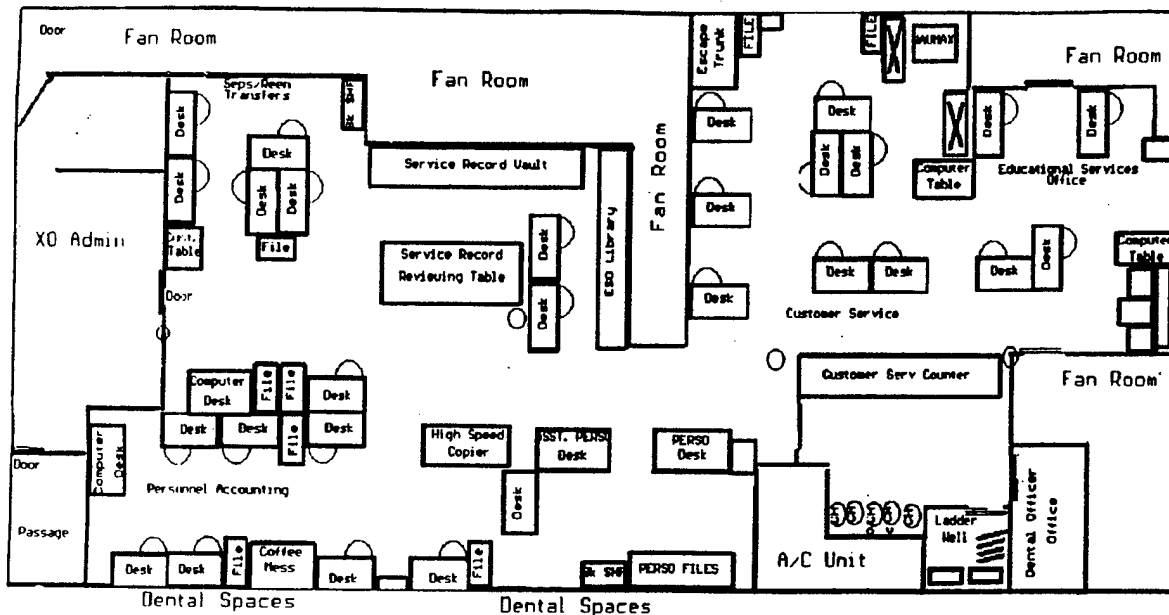
Figure 12. Layout of the Personnel Office Before Reorganization.

(2) Administrative Services - PDCA Cycle..

STEP 5 - ANALYZE ROOT CAUSES.

The PAT determined the root cause of problems was due to expansion of responsibilities of the pay and personnel support offices. The original process was not automated, far less complicated and not as technical as it has developed into.

STEP 6 - PLAN THE IMPROVEMENT.

The PAT developed innovative techniques to address the root cause including consolidating personnel support for officers and enlisted under one Personnel Office with concomitant modifications in how pay and personnel support is traditionally conducted. An expanded initiative was developed and is currently pending approval from higher authority which consolidates disbursing and personnel operations into one

department with "one-stop shopping" for disbursing and personnel support. Highlights of the innovative techniques implemented include:

1.   Customer Service.

Customer service counter is the control point for receiving all pay and personnel inquiries and transactions, and assists crewmembers and/or Departmental Pay and Personnel Support Liaison Representatives (DPPSR) in completing forms applicable to their transaction.

- Manned by two people dedicated exclusively to customer service.

- Self-Help Counter. Use of a self-help counter minimizes time spent with a customer and prevents a backlog when another customer may have a more time consuming transaction. Pay and personnel related forms (with completed samples posted) are available and include VHA certificate, SGLI, allotments, W-4, SITW, bonds, DDS enrollment, dependent enrollment, dependent dental, continue DDS. Additionally, newly reporting sailors obtain a preassembled receipts package and are referred to a self-help counter located in the Receipts Section. Completed sample forms are posted to assist in completing the receipts package. Once the receipts package is complete, a receipts "technician" will process the new receipt. All receipts' pay and personnel related transactions are completed within three hours rather than the old standard of 6 - 9 days.

- No telephone at the customer service counter. Clerks devote full attention to the customer. Telephone inquiries are handled by a research and analysis subsection (troubleshooters) of the Production Section (discussed below).

- Answer all pay and personnel inquiries. Customer referred to research and analysis technician located in a Production Section when unable to assist. A data base terminal is available to respond to personnel inquiries.

- All customer service counter form transactions are passed to a Production Section (discussed later) for input to and/or release.

- An "Administrative Customer Service" E-mail address has been created to serve customers without the need to leave their work center or use the telephone for service.

2. Production Section.

Prepares transactions received from Customer Service Counter, Receipts, and Transfers/Discharges/Reenlistment Sections.

- Seven personnel assigned (Section Supervisor/Auditor/Releasor, four personnel men prepare transactions, two Research and Analysis Technicians.

- No customer encounter (except research and analysis subsection) which allows improved accuracy and timeliness for processing transactions.

- No telephones (except research and analysis subsection) which allows improved accuracy and timeliness for processing transactions.

- Receives copy of travel claim from travel section to verify entitlement during TAD periods (not happening currently).

- Research and Analysis subsection manned by two technicians. This group handles pay and personnel inquiries referred by Customer Service Counter and telephone inquiries and answers pay and personnel inquiry messages from E-mail.

3. Departmental Pay and Personnel Support Liaison Representative.

A Pay and Personnel Support Liaison Representative (DPPSR) is designated in each department. The person assigned this responsibility is a Departmental Yeoman or other administrative rating. A monthly meeting is convened with departmental representatives to discuss pay and personnel matters/problems/solutions. This format is more responsive to the deckplate level. Rather than a crewmember taking time off work to conduct pay and/or personnel business, the DPPSR acts as point of contact between respective department and the customer service counter. The representative can coordinate most pay and personnel business pertaining to members of their department.

- A Departmental Liaison Representative handbook has been developed that explains every type of pay and personnel transaction, what form(s) should be completed pertaining to a transaction (e.g., DDS enrollment, etc.), samples of completed forms and guidance on proper submission of transactions to the consolidated personnel office.

- A three-part transmittal form has been developed (see Figure 13) for use by the DPPSR to forward transaction(s) (DDS enrollment, service record entry

for training completed, evals, etc.) to Customer Service (or hand carry). The DPPSR retains a copy as a tickler. Once action is completed, a copy of the transmittal form with action complete noted by the customer service representative is returned. The current process is time consuming for the crewmembers needing assistance. The crewmember must wait in line while visiting two locations to conduct pay and personnel business during working hours. This new process limits backlogs of customers while allowing for better productivity by crewmembers (more time on job, quality lunch/dinner period). This will accommodate 50% of pay and personnel business (DDS enrollment, service record entries, etc.).

Document and Information Transmitial Form   Date: _____

FROM:				TO:			
NAME (LAST, FIRST, M.I.)	DATE	SSN		3			
1				4			
2				5			

1. Request the appropriate service record entry be made as indicated below:

a.CORRESPONDENCE COURSES REQUIRED FOR ADVANCEMENT

DESCRIPTION OF COURSE, RATE OR NAVPERS NUMBER	DATE COMPLETED

b. PERSONNEL QUALIFICATION STANDARDS (ATTACH SIGNATURE RECORD

PQS TITLE	PQS STATION NO.	DATE

c. NAVY SERVICE SCHOOL/MILITARY TRAINING COURSES (ATTACH COURSE COMPLETION CERTIFICATES)

COURSE TITLE/SCHOOL	NEC	DATE ENROLLED	DATE COMPLETED	LENGTH	GRADE	GRAD	DROPPED

d. OTHER TRAINING COURSES/INSTRUCTIONS (ATTACH COURSE COMPLETION LETTERS)

DATE COMPLETED	TYPE OF COURSE AND/OR INSTRUCTION	LOCATION	DURATION

e. PERSONNEL ADVANCEMENT REQUIREMENTS

DESCRIPTION	DATE COMPLETED

f. RECORD OF OFF-DUTY ED/VOC/TECH TRNG & OTH CORR. CASES

NO./TITLE OF CASE/TEST	SCHOOL	DATE COMPLETED	GRADE

g. AWARDS (Citation Attached)

AWARDS NAME	DATE OF AWARD	AUTHORITY	ADV.

2. Miscellaneous:

Verify, sign and return documents. (Explain in Remarks Section)
Request Service Records be provided.
Leave Papers. ( ) Part 1 ( ) Part 3. forwarded.
Recommended to participate in next ( ) E3 or ( ) M/L examination.
Pay Inquiry (explain in remarks - attach LES)

Remarks:

_____
Signature, Rank/Rate, Title

ENDORSEMENT Returned, action completed as requested/indicated above.	DATA BASE UPDATE DONE (when appropriate) _____ initial / date
Signature, Rank/Rate, Title	Date:

CVN 70 FORM 5216/1

Figure 13. Document and Information Transmittal Form.

STEP 7 - <u>DO</u> THE TEST.

Figures 14 and 15 show a pie chart summarizing the time spent by customer service section and a layout of the personnel office, respectively, after the reorganization.

USS CARL VINSON (CVN 70)

DOCUMENT PREPARATION
NOTE 2

TELEPHONE INQUIRIES
NOTE 3

CUSTOMER SERV
COUNTER
95%
NOTE 1

MILITARY
REQUIREMENTS
5%

ID CARD PROCESSING
NOTE 4
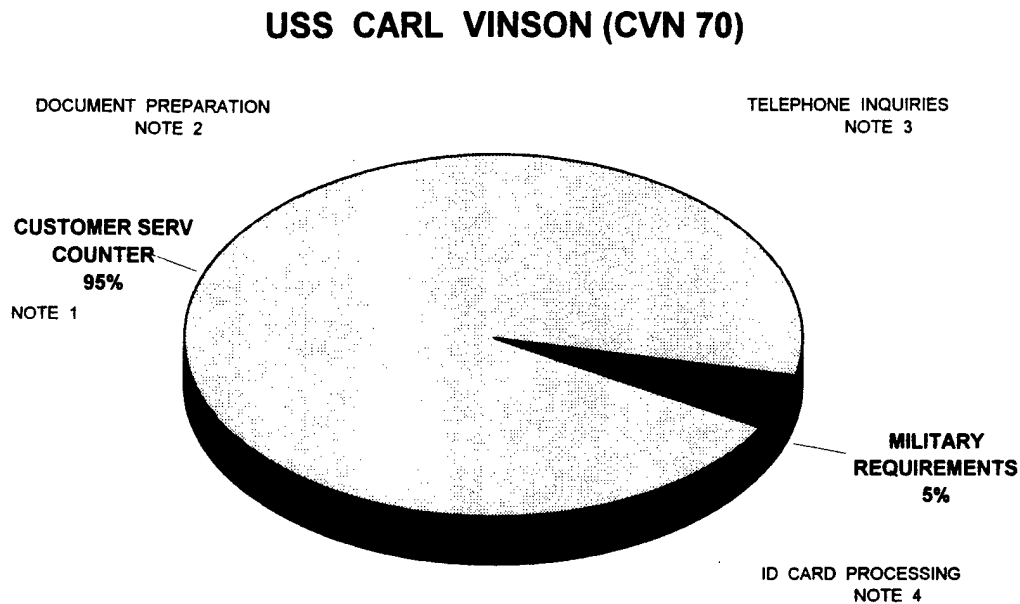
USS CARL VINSON (CVN 70)
DUTIES IN CUSTOMER SERVICE SECTION <u>AFTER</u> CONSOLIDATION

DUTIES		DESCRIPTION
Customer ServiceCounter Inquires	95%	Customer turns in forms for processing. Answers routine pay and personnel inquiries through use of UMIDS and data base, corporate knowledge. Verifies forms completed properly, responds to ATM inquiries.
Document Preparation		None. Passes all document transactions to Production Section for processing.
Phone Inquiries		None. No phone.
ID Card Processing		None. Separate ID section. Customer no longer waits turn at Customer Service Counter to process ID Card.
Military Requirements	5%	Same.

Figure 14. Time Spent by Customer Service Section After Reorganiztion.

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Figure 15. Layout of the Personnel Office After Reorganization.

STEP 9 - <u>CHECK</u> THE RESULTS.

Appendix L shows the progress in customer satisfaction through the responses to a survey addressed to a sample of the crew conducted before and after the reorganization.

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STEP 10 - <u>ACT</u> ON RESULTS.

Customer feedback indicated the need to relocate the Customer Service Counter. Customers entered the Personnel Office and were unsure of where to go to get basic information. They would approach the first clerk they saw and start asking questions. Personnel assigned to specialized areas (i.e., reenlistments, discipline, separations) would be interrupted from their customers and direct the new customer to the counter. The customers would feel like they were getting the runaround resulting in the other sections becoming unnecessarily crowded.

The solution was to relocate the Customer Service Counter to the point closest to the main entrance of the work center. This included also moving the ID card laboratory to the Customer Service Counter.

Additionally, since officer personnel accounting and service record maintenance was shifted to the Personnel Office from the Captain's (CO) Admin. Office, the ship essentially had two admin. offices (XO's admin. and CO's admin.). The two offices were consolidated into a single ship's admin. office. This streamlined correspondence routing procedures and eliminated confusion by customers on which admin. office they had to deal with based on what type of service was desired. This is unique for all aircraft carriers in the Navy.

STEP 11 - STANDARDIZE AND MONITOR.

Updated Departmental Pay and Personnel Support Representative (DPPSR) Manual, Travel Order and Claim directives, and created new and/or modified existing transactions checklists.

STEP 12 - FURTHER ACTION?

Vastly improves customer and pay and personnel workforce service/job satisfaction levels (see Appendix L), and elicited better confidence levels by customers of services provided. Other aircraft carriers are copying this unique organization (Lincoln, Eisenhower, etc.).

b. Weapons Qualifications Program

Part of the physical security of the ship includes employing armed guards at the entrances to the ship. These guards must qualify at least annually on the weapons that they carry. G-2 division manages the program for qualifying a pool of approximately 200 personnel and has employed run charts in the interest of improving the process. As division

personnel monitored the results of the individual qualification firings, they learned enough about the process to make some adjustments, resulting in both improvement and stabilization. The charts maintained by this division have been in use since January 1994. The process is now being transferred to control charts for monitoring. Updated run charts are shown in Appendix K [Ref. 12: p. 21]. An explanation about the main issues related to this particular process improvement effort follow:

(1) Weapons Qualifications Program - Process Simplification.

STEP 1 - SELECTION OF THE PROJECT.

The process was selected for further improvement because of increasing complaints from customers about the quality of training and frequency of qualification for new personnel. The G-2 division officer looked at the numbers of personnel actually passing and began charting data in order to stabilize the process.

STEP 2 - ORGANIZE THE TEAM.

No specific team was chartered to collect data. Personnel in place (process owners) provided the data.

STEP 3 - DEFINE THE PROJECT.

The number of personnel passing weapon qualification for each of three different weapons were tracked to determine what impacted the process with the goal of stabilizing and improving it over time.

STEP 4 - STUDY THE CURRENT SITUATION AND SIMPLIFY THE PROCESS.

The Division chief at that time (JAN 94) was using his own set of range procedures. Under the new division officer, the division began to use Navy standard procedures.

(2)   Weapons Qualifications Program - PDCA cycle

STEP 5 - PLAN THE IMPROVEMENT.

The proposed solution to improve the process was simply to follow standard Navy range procedures. No permission was required to conduct the test. The G-2 Division Officer and the LCPO own the process.

STEP 6 - DO THE TEST.

New procedures were put into practice on April 1994. Data collection started on Jan 94 (see Appendix K).

STEP 7 - CHECK THE RESULTS.

Run chart continues. Change in percentage passing noted after the ship began to follow standard Navy range procedures.

STEP 8 - ACT ON RESULTS.

After checking the results, standard Navy range procedures were adopted permanently.

STEP 9 - STANDARDIZE AND MONITOR.

Written procedures were adjusted in pertinent manuals. Run charts continue to monitor the process for further improvements.

STEP 10 - FURTHER ACTION?

The next suggested improvement, derived from a brainstorming session, is to conduct on-range training and assistance. This issue is currently being addressed by the G-2 division.

C.   DISCUSSION

This section summarizes the main findings from the four research techniques used to assess the TQL implementation process onboard the USS Carl Vinson. This conclusions derived from each research technique have been arranged by using the Fourteen Points as this

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framework is useful in assessing an organization engaged in a quality management approach like TQL.

> Point #1. Create and publish to all the crew a statement of the aims and purposes of the organization. The management must demonstrate constantly their commitment to this statement.

The most reliable technique to assess this point was the crew questionnaire which ranked this point first among all the Fourteen Points. The ship not only created and published its mission, vision, and guiding principles statement but they also have been continuously updating these statements through the ESC, which is a clear demonstration of top leadership's commitment. The responses to the crew questionnaire confirm that most of the crew understands the meaning of this statement which is a clear demonstration that the statement has been properly disseminated. Also the decision of assigning to the department heads the authority and the freedom to implement TQL at their own pace allowed them to create their own mission, vision, and guiding principles statement without rush, thus, increasing their commitment to these statements and a clear understanding of the link between individuals, divisions, departments, and the ship.

> Point #2: Learn the new philosophy, top management and everybody.

The ship is clearly assigning a high priority to this point through a continuous effort in conducting formal TQL training onboard. However, as recognized by most top leadership in their responses to the written questionnaires, the high turnover of personnel constitutes a serious obstacle for the crew to gain knowledge on the new philosophy. Also the ship does not have enough personnel trained in the use of statistical techniques, thus, preventing the ship from consistently making use of the broad variety of tools provided by TQL to improve processes. All the processes described in this chapter, though having achieved positive results, lack the consistent use of analytical tools to obtain and document the improvements. Of special mention is the lack of use of control charts to effectively monitor the processes.

To overcome this drawback, the ship is planning to train more people on statistical techniques commonly used by TQL.

Point #3. Understand the purpose of inspections, for improvement of processes and reduction of cost.

The ship is clearly increasing the use of teams to approach problem solving. They are looking at processes to find the root causes instead of looking only at products to effectively make improvements. However, it appears that analytical tools such as control charts and the PDCA cycle could be systematically utilized in process improvement efforts better. In fact, all department heads responded that they are using TQL approach to improve specific processes selected by themselves and that most officers have accepted this new quality management philosophy. However, from the responses to the crew questionnaire, there is still a tendency in some crewmembers to trust in formal inspections as the best way to improve results instead of looking at processes. According to the Command TQL coordinator, formal inspections sometimes constitute an obstacle to TQL efforts in the sense that the ship is forced to concentrate a lot of efforts to be successful in the inspection.

Point #4. End the practice of awarding business on the basis of price tag alone.

As shown by the responses to the crew questionnaire, the ship still has some areas to address relevant to this point. However, they are trying to make some advances in this area with efforts such as the engineering department's attempt to improve relationship with maintenance suppliers and the continuous meetings and negotiations with an external supplier to obtain the best product in relation to the projected installation of a bar-code/I.D. scanning system onboard. The ship has not yet chose to address this point in a comprehensive fashion. In fact, according to the TQL coordinator, supplier relations is in fact one of the last areas to be addressed when following Navy quality implementation models.

Point #5. Improve constantly and forever the system of production and service.

The lack of expertise in the use of analytical tools by the crewmembers is again an obstacle to effectively addressing this point. In fact, a good understanding of the concept of variation and the use of the PDCA cycle are crucial to process improvement. However, the ship is gaining knowledge and experience in process management which means that they are aware of the necessity of focusing on the processes and that leaders are responsible for the system. The ship is using the concept of teamwork to improve processes in all departments and, according to those processes described in this chapter, they are looking at the system rather than blaming people. In fact, from responses to the crew questionnaire, sailors do recognize that they can get significant improvements by focusing in the processes that make up the system.

Point #6. Institute training (for skills).

The primary research technique to assess this issue is the responses to the crew questionnaire. In general, sailors understand the concept of customer and believe they are properly trained to get their job done. Moreover, they agree that leadership is also concerned with ensuring that they are trained to get the job done. However, according to their responses, the ship is not extensively using the resource of rotating them among different jobs to increase cross training in performing various positions.

Point #7. Teach and institute leadership.

According to the responses to the crew questionnaire, sailors perceive leadership positively. In their perception, leadership is usually helping them to perform better and is usually willing to voluntarily share experience with them to facilitate their job. Also the decision of allowing department heads to implement TQL at their own pace positively contributes to leadership as they gain authority and commitment to the transformation process instead of being continuously enforced and pushed to accomplish specific goals. In addition, periodic appearances on closed circuit TV by the CO and informal meetings held by the

department heads contribute to reinforcing leadership onboard the USS Carl Vinson as the crew tends to feel closer their leaders. The only problem noted in relation to this point is that, according to the responses to the written questionnaires, the lack of understanding and training on TQL by some senior enlisted personnel could negatively affect leadership as they constitute, in some cases, a sort of interruption in the chain of command in relation to the transformation process.

Point #8. Drive out fear. Create trust. Create a climate for innovation.

According to the USS Carl Vinson's leadership style discussed in the last point (point #7), the responses to the written questionnaires, and the responses to the crew questionnaire, fear is not a significant barrier to implementing a quality management philosophy onboard the ship. None of the selected top leadership mentioned fear as a potential barrier to TQL implementation in their written responses. Also sailors fell relatively free to pass up the chain of command even the bad news and they have confidence that their superiors will react properly. The only negative aspect related to this point is that in some sailors' perception, they are not properly rewarded for making process improvements in the workplace.

Point #9. Optimize toward the aims and purposes of the ship the efforts of teams and groups.

The decision of letting the department heads create and manage their own DSCs and develop their departmental mission, vision, and guiding principles statement is an excellent way to ensure that the teams' efforts are directed toward the aims of the department and the ship's purposes. However, there is a risk in the sense that, if not wisely managed, in time departments could be led to meet their own goals rather than looking at the ship as a whole. In the author's experience this issue is crucial because most of the strategic processes managed onboard any ship are cross-functional among departments, thus, requiring their active and balanced participation in process analysis as well as decision making. The USS Carl Vinson is managing in-depth only a relatively few processes under the TQL approach.

Problems are more likely to arise in the future when they decide to approach in-depth more sensitive processes such as the responsibilities of DC material maintenance and conservation. In addition, according to the responses to the crew questionnaire, sailors feel some lack of coordination and integration of their individual efforts. Moreover, a number of them believe that everybody wants to be a super star in the job and that many do not care about doing the right things for the benefit of the department or the ship as a whole.

<u>Point #10.</u> Eliminate exhortations for the workplace.

According to the responses to the crew questionnaire, many sailors feel that exhortations exhibited throughout the ship and/or slogans repeated by supervisors are not helping them perform better. There is no additional reference to support this negative perception from the rest of the research techniques used. In the author's opinion, the crewmembers' responses to this point could be misleading in that many of them could mean a "Not applicable" response instead of an "Undecided." In other words, sailors could actually mean that there are no slogans spread throughout the ship and/or that leadership do repeatedly ask them to "take pride in their work" in a way or circumstance that they judge proper. The important thing here is to take into account that rather than ask people to perform a better job through words or slogans it is much better to help and empower them to perform a better job.

<u>Point #11.</u> Eliminate numerical quotas and management by objective (MBO). Instead, learn and institute methods for improvement and learn the capabilities of processes and how to improve them.

Most of the processes or issues approached by the ship using the TQL philosophy described in this chapter have used hard data for the analysis. This is, no doubt, a good starting point to eliminate the traditional management method of setting numerical targets without basing these targets on the data-based measures of a process. However, the lack of expertise in the use of analytical tools prevent the ship from fully implementing methods for improvement. That is, data collection is but one of the requirements to process improvement.

The in-depth analysis of two processes approached by the ship are an example that the PDCA cycle has been only partially used to improve processes. The ship is aware of this issue and they are working hard to efficiently train people in analytical techniques and to empower them to use in a more effective way all the variety of resources provided by TQL. On the other hand, according to the responses to the crew questionnaire, in sailors' perception leadership still tends to believe that numerical quotas are required to keep sailors motivated. In the author's opinion that could be true, especially under the military environment, but the theme here is how to determine those targets in such a way that they are reachable and based on the process capability.

Point #12.   Remove barriers that rob people of pride of workmanship.

Good leadership is crucial to this point. If senior enlisted personnel are not trained in TQL, according to the responses to the written questionnaire, they could be unconsciously putting an additional barrier on sailors to getting their job done under this new management approach. However, top leadership committment to the transformation process tends to offset this barrier as the crew knows that the course is already given by the command and the various committees. On the other hand, according to the responses to the crew questionnaire, some sailors believe that one of the main barriers to doing a better job is simply not having the required time and other resources readily available. Sailors, especially the youngest, feel that sometimes supervisors use specific procedures to evaluate performance that contribute to creating additional barriers to performing better in comparison with the general guidelines included in the Navy performance appraisal system.

Point #13.   Encourage education and self-improvement for everyone.

The ship is conducting a valuable effort to make educational resources available onboard to any sailor. The Carl Vinson Information System Committee and the Learning Resource Center Committee, both strategic committees chartered by the ESC, are clear examples of these efforts. According to the responses to the crew questionnaire, sailors

broadly recognize these efforts by assigning positive scores to all the questions related with this topic. The ship is not only looking for increasing sailors' motivation but they also understand that the higher the education level of sailors the better they are prepared to deal with process improvement, including the appearance of new technologies.

Point #14. Take action to accomplish the transformation.

There is lot of evidence that the USS Carl Vinson is taking action. The plan for quality improvement is actually published and put into practice at all levels onboard the ship. It is no doubt a live document that calls for action and change. Top leadership has formally considered TQL training as a high priority to establish as soon as possible the critical mass. Top leadership understands that the transformation process must involve the crew; leadership cannot do it alone. Most sailors agree that they have personally witnessed the use of TQL to successfully improve a process onboard. However, there is an important group, especially among those who have an average experience or involvement in TQL, that believe that the only ones really interested in the new approach are leadership. Most processes described in this chapter have used TQL to approach process improvement. In addition, according to the responses to the written questionnaires, top leadership, especially the CO, is strongly committed to the transformation process. Summarizing, the ship is actually taking action to accomplish the transformation process according to a preestablished but flexible schedule, though everybody onboard, especially leadership, is aware that it is not easy to see results, at least in the short term.

D. CONCLUSIONS ABOUT CURRENT STATUS OF TQL ONBOARD THE SHIP

1. The ship is strongly committed to continuing its TQL efforts and is following a well designed plan including a unique approach to TQL implementation. It is true that at the very beginning there was a sort of false start but with the change of command the ship started again and they are on track according to the new plan. The responses to the questionnaire showed that most sailors know and fully understand their ship and department mission.

2. The main aspect of the new approach is that after realizing that it would very difficult to manage processes at the ship level, the new CO allowed each department to undertake the philosophy at their own pace and under their own team structure. This is a recognition of both: the complexity of managing the whole thing from the top and the acceptance that each department has its own reality in terms of adopting the new philosophy.

3. The main processes, affecting operational and personnel issues, are managed from the top through the ESC and the Gold Eagle Team. In that way these committees can effectively address the most important points, those producing the highest leverage in the transformation process, leaving to each department to put into practice the TQL implementation process within their environment. Obviously, the department heads are allowed and even encouraged to coordinate with other departments to get the required support at improving processes that involve more than one department.

4. Top management is effectively committed to the transformation process, especially the commanding officer. The author personally interviewed the CO, apart from the written questionnaire, and had the opportunity to observe his high and honest level of commitment. The CO actually believes in the new philosophy even though at the same time he recognizes the necessity of overcoming some barriers for successful implementation. In that sense he knows that is difficult to get results overnight.

5. Most people filling the highest positions agree that one of the main barriers to implement TQL is that people, especially seniors, are not trained enough in TQL to fully understand the philosophy. Many of them think that TQL is no more than another management technique that will fade away with time like many others embraced by the Navy before. This in turn produces a negative attitude toward the transformation process as many of them are key people in the process thus interfering with innovation.

6. To help overcome this main barrier, the ship is offering many courses on TQL using its own resources, including instructors. This program includes a general picture on TQL for those who are just arriving to the ship. The CO assigned a high priority to TQL training as he saw the necessity to create a critical mass to ensure success in the transformation process. However, high turnover in personnel implies that many of the highly TQL trained personnel have to leave the ship every year thus constituting another obstacle to speed up the process. Nevertheless, if this issue is viewed from a higher level of analysis, these people bring with them all their skills to the new command. In the long run, the benefit will be not only for the Carl Vinson, but also for the Navy as a whole.

7. The ship and, especially leadership, is starting to understand that quality is a constant priority and that everyone onboard should be involved in the transformation process. Leadership's role is also changing under the new philosophy; they now feel their job is more as a coach or a facilitator rather than the traditional "judge." Responses to the questionnaires show that sailors onboard the ship recognize these important changes.

8. Leadership also understands that most of the failures reside in the system and not in the sailors. Responses coincide in that everybody is starting to view processes for improvement. Leadership understands that sailors are in the best position to prevent defects. However, the lack of training in TQL statistical tools prevent the crew from doing a better job in analyzing processes using a data based perspective. The ship recognizes this deficiency and the TQL coordinator is looking for alternatives to overcome this problem.

9. One important finding is that there is a proper climate onboard the ship to foster innovation. That is, people do not feel fear to pass up the chain of command the "bad" news that require upper level involvement. Even though there are still some residual issues to improve on this point, leadership onboard the Carl Vinson is responsible for having created the proper atmosphere to foster direct communication and feedback. This is an excellent point for continuous leveraging of the transformation process. In fact, fear usually is one of the main barriers for TQL implementation and, moreover, a barrier difficult to overcome, especially in the military environment.

10. It has been difficult for the ship to improve relations with external suppliers given the many rules and regulations affecting the procurement process. However, there are two points that deserve special consideration. The engineering department has been very successful in applying this concept as they manage their relations with subcontractors and other external suppliers to improve products and services they provide. This department has understood the convenience to establish win-win relations with suppliers. The other point is that sailors are starting to understand the importance of the concept of internal customers and suppliers. Responses indicate that at least they are able to identify products and services for each customer-supplier relationship.

V. TQL AND CHILEAN NAVY WARSHIP ENVIRONMENT

This chapter analyzes the Chilean Navy culture and addresses some new challenges facing the Navy for the coming century. It also provides an assessment of how Deming's Fourteen Points might be applied onboard Chilean warship environment using the experience of the US Navy discussed in Chapter IV. Conclusions are included in the last section of this chapter and are oriented to summarize the main findings leading to assess as to what extent it is feasible and convenient to adopt a quality management approach like TQL onboard the Chilean Navy warships in light of the environment they face and the experiences of the USS Carl Vinson.

A. CHILEAN NAVY CULTURE

The Chilean Navy occupies an important place in the Chilean society. The following quote from Benjamin Subercaseaux in his book "Land of Ocean" helps provide a better understanding of this relationship: "Chile was born for the ocean, from the ocean her natives were fed, by the ocean her conquest was consolidated, in the ocean her independence was guaranteed, from the ocean food must be drawn, without the ocean commerce has no sense" [Ref. 15: p. 5]. The vital role of the ocean in Chile's development has been broadly shared by most governments and common citizens throughout history.

In fact, the Chilean Navy has played a vital role in the country's development; in peacetime as well as in wartime. Accordingly, the Chilean Navy is very appreciated by most citizens; people feel proud of Navy personnel and associate them with values such as tradition, honor, patriotism, and love for public service. The Chilean Navy was essential to the success of the four wars faced by the country in the last century [Ref 15: p. 60]. As Bernardo O'Higgins, Chile's founding father, said after one of the main battles during the independence war, before the Chilean Navy was officially created: "this victory and hundreds more will be useless if we do not have the command of the sea. Our geography imposed the necessity of having a strong Navy which should act before our military forces if we are to be

successful in the years coming and forever." These words reflect exactly what really happened during each of the subsequent wars.

In peace time the Chilean Navy has been also very important in the development of the country. Chilean warships have contributed to spreading development to remote areas difficult to access by other means. The use of Navy aircrafts and warships to bring food, medicine, and other resources to the Robinson Crusoe and Easter Islands' inhabitants are but only one example of this Navy's commitment. On the other hand, the Chilean Navy has been continuously looking for new ways of protecting Chilean maritime resources. In this context, the current Commander in Chief of the Navy (CCN) created a new concept in the understanding of maritime spaces called "Mar Presencial" generating a whole "Chilean Maritime Territory" (see Figure 16 [Ref 16: pp. 5-6]). The underlying idea behind the concept is to preserve the maritime resources in that space and to recognize the Chilean Navy's responsibilities on issues such as pollution, piracy, and safety of life at sea. This concept has been also very important in educating the common citizens, especially politicians, to the fact that the sea is called to play an important role in the development of the country.

The Chilean Navy culture is better understood by examining its traditions, values, norms and beliefs as they apply to the organization as a whole and are shared by every member. As a set, they contribute to shaping the way the Chilean Navy actually does business and therefore are a good framework to analyze perspectives for potential applicability of TQL in its warships.

The traditions of the Chilean Navy play an important role in shaping its members' behavior as well as the organization's duties. To avoid being engaged with any new fashion coming from the outside world that could jeopardize the most valuable Navy's traditions, the Chilean Navy has very strict regulations describing in detail most of the specific actions and rites to be accomplished by every member and entity within the Navy. In general, these traditions have experienced few changes since the Navy was formed, toward the beginning of the nineteenth century. Consequently, the Chilean Navy strongly believes that keeping traditions constitute a strength in terms of ensuring successful long range survival. At first

glance, an outsider could think that this posture gives little chance for innovation or adjustment to the external environment. However, citizens' approval is the best proof of the successful strategy followed by the Navy in this respect. In reality, most of the traditions contained in regulations relate to seamanship practices and formalities in terms of the use of the uniform, respectfulness of state symbols, accuracy in protocol activities involving movement of minor boats at sea, and other rules for ships and shore facilities in relation to naval formalities in their routine activities [Ref. 17: pp. 48-52]. However, a more in-depth analysis of this part of the Chilean Navy culture leads to the recognition that these types of traditions do not affect the Chilean Navy's ability to manage changes, deal with innovation, or be responsive to the external environment. In fact, they are two different issues.
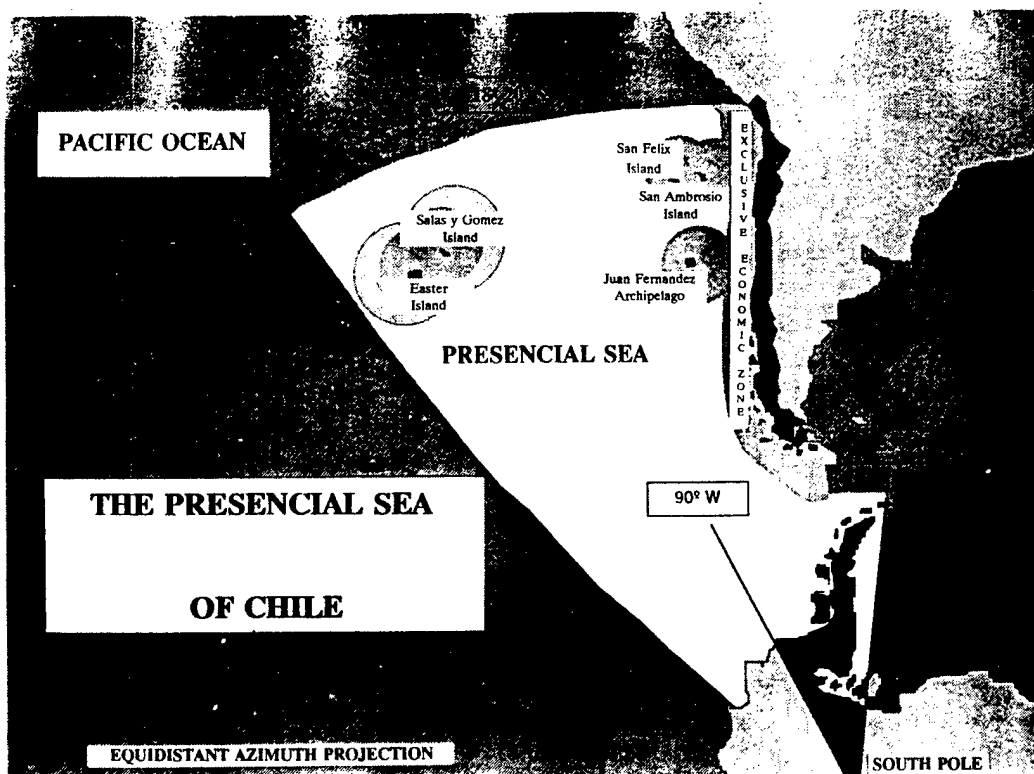
Figure 16. The Presencial Sea of Chile.

Chilean Navy's ability to deal with changes in the external environment has been proved in various ways. In the operational arena, continuous changes in Chile's international relationships have created additional difficulties in the acquisition of new assets, such as ships, to meet operational needs. In addition, it is well known that it is not always easy for a developing country to buy new ships to meet their operational needs at a reasonable price. To overcome this issue, by the end of 1990 the Navy committed to a renovation plan, oriented to developing their own weapon systems through an organized technology transfer process [Ref. 18: pp. 592-607]. To deal with this challenge, the Navy reorganized the highest part of the organizational structure by creating a sort of matricial structure with the incorporation of the heads of specific programs and projects at the same level of the traditional functional directorates. The whole strategy followed by the Navy to deal with this plan has been extremely successful. Even foreign senior officers that have visited Chile recently have been positively impressed by the amount and quality of changes that the Chilean Navy has introduced to relatively old platforms changing dramatically their original operational roles. Of course, the advantage of this approach is not only the possibility to improve operational capabilities at a relatively low cost, but also the collection of all the experience and lessons learned during the process.

The values of the Chilean Navy are primary based in the concept of morality and leadership. The Chilean Navy stresses the necessity of having moral values which forever have played a decisive role in the life of countries and institutions, especially when they are subjected to extreme pressures. In this context, leaders are required to teach morality to their subordinates, mainly through the example of their attitudes and acts [Ref. 19: pp. 7-8]. Justice, prudence, courage, sobriety, and obedience are considered the main moral virtues taught to subordinates [Ref. 20: pp. 55-57]. In addition, patriotism, military honor, loyalty, abnegation, espirit de corp, subordination, discipline, duty accomplishment, and leadership are considered the primary fundamental moral virtues for anybody serving in the military [Ref. 20: pp. 58-64].

This main concern in ensuring that every member acquires these moral values means that the Chilean Navy strongly relies on its members' humanistic education to do business and ensure success. However, for this theory to be successful the assumption is that people effectively possess and share those values and use them to the benefit of the organization. In the author's experience, Chilean Navy members do share those values though it is becoming more difficult to maintain the importance of having these values as the society is being moved to a more materialistic way of life that see principles and values from a practical rather than from a deeper perspective. The tendency to reduce importance of honoring heros is a classic example of this trend. Again, it is important to differentiate this concern for moral values and principles with the ability to innovate and to have a good fit with the environment. Another example of the Chilean Navy's willingness to change is the continuous effort developed by the Personnel Directorate to adjust the educational process to the continuous changes in technology and operational needs.

On the other hand, the Chilean Navy is a highly disciplined and hierarchized organization with effective top down communication, which strongly relies on leadership's effectiveness to ensure success. In this sense, the Chilean Navy recognizes that military leadership is qualitatively different from other types of leadership primarily because of the objective of the military leadership: bring people to the combat resolved to offer their lives for an ideal. For this philosophy to be successful, the transcendency of the mission must be of such a value that people would be willing to offer their lives to accomplish it. However, the Chilean Navy is aware that military leadership should take advantage of valuable and useful techniques from other types of leadership to achieve intermediate objectives but without ever forgetting the unique nature of its existence [Ref. 21: pp. 463-469]. Knowledge gained on recent research on charismatic leadership theory where charisma is considered having more importance than a lengthy list of leadership traits is an example of areas in which the Chilean Navy has updated or reinforced its understanding about leadership [Ref. 24: p. 33].

The most important norms and regulations to be accomplished by the Chilean Navy's members are contained in the Navy's master regulation, the "Chilean Navy Ordnance" [Ref. 20]. This publication describes in detail the expected behavior of people when filling any position in the Navy. From the specific duties of the division officers onboard ships to the general duties performed by any member within the institution, the "Chilean Navy Ordnance" establishes duties, obligations, and procedures to be followed by every member, whatever position he or she is filling. This publication is intended primarily to standardize behavior of the Chilean Navy members according to what the Navy expects from them in various situations they might face. In no way, it is intended to constrain the initiative to carry out daily business or to restraint the ability to innovate or create improvements in the workplace to better accomplish specific tasks. In the author's experience, this document is widely used at all levels of the Navy and constitutes the "master document" to sort out any discrepancy of opinion in topics where the Navy has already been very clear in establishing guidelines and benchmarks.

B.   INFLUENCE OF THE EDUCATIONAL PROCESS

It is very difficult to get a good understanding of the Chilean Navy culture without any reference to the Navy's educational process. Education in the Chilean Navy consists of basic formation as a military, professional instruction to perform in various duties during the career, and the acquisition of the required skills to perform repeatedly more standardized tasks. In other words, education process includes formation, instruction, and training. Of these three broad types of activities, basic formation is the one which has the strongest effect on the Navy culture. The main purpose of the basic formation phase within the whole educational process is to raise seamen; individuals with the character and attributes required to successfully face the challenges imposed by the life onboard. The other two activities, instruction and training, are a consequence of the formation process. That is, they are mainly influenced by the strong commitment of every individual to put as much effort as required to perform in the best way in any activity in which the individual is engaged. This means that, in the Chilean Navy, the motivation for continuous self-improvement is always present and the only limitation is that

typical of any human being. Consequently, this section describes and analyzes the formation process focusing on its contribution and implications to the Chilean Navy's way of doing business.

In opposition to other Navies who have multiple means of Officer accession, the Chilean Naval Academy is the only institute in Chile authorized by law to form Navy officers. This means that all the officers are educated and raised as seamen in the Naval Academy. This fact provides the Navy with a valuable opportunity to standardize certain values and principles among officers. Midshipmen usually joint the Naval Academy at the age of sixteen and spend four years matriculating. At this age it is easier for the youth to acquire and internalize new values as their character and personality are still rather malleable. The formation process at the Naval Academy includes the wholistic formation of the midshipman and the acquisition of all the moral values and principles characteristics of the Chilean Navy culture as discussed in the prior section. Of course, during the process there are some who cannot bear the strict schedule of activities and duties demanded by the Naval Academy, and are others who do not feel comfortable with the formation process. They simply leave the Naval Academy when they judge proper and timely.

The educational process at the Naval Academy plays a very important role in the way the Navy does business as the core of its mission is to prepare leaders for commanding people within the warships environment. Leadership in the Chilean Navy, according to the Vice Admiral Juan Mackay [Ref. 21: p. 469], must be understood as founded in the leader's moral, intellectual, and professional authority; exercised with diligence, abnegation, and justice; and taught with prudence, humanity, and experience. In defining leadership, he added, it is, first of all, a profound tie of sincere affection between leaders and subordinates. This definition of leadership provides a framework to better understand the way the Chilean Navy conducts business.

As all Navy officers are formed in the same academy and under the same rules, one of the primary outcomes is that most of them share the same core values and act or react in a similar way when faced with problems within the professional environment. It is important

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to make clear that this sort of standard behavior among officers does not preclude them from pursuing improvements but rather should be seen in a positive way in terms of improving coordination and integration among leaders in various positions, as they share the same core values and principles. However in the author's opinion, what it is true about the influence of this basic formation process is that it sometimes makes it more difficult for senior leadership to accept changes jeopardizing in any way the core values and principles acquired at the Naval Academy.

On the other hand, it should be mentioned that the formation process for the enlisted personnel has similar characteristics as that for officers. Enlisted who fill positions onboard the ships are also graduated from only one institute: the "Enlisted Naval Academy." They follow a similar formation process as officers. In addition, it is important to remark that the Enlisted Naval Academy exhibits an important prestige among common citizens resulting in a very good annual population of applicants thus allowing the Navy to choose among the best.

C.   CHALLENGES TOWARD THE NEXT CENTURY

The Chilean Navy has not been dramatically affected by the vital changes recently occurred in the East Europe. The demise of the ex-Soviet Union and the fragmentation of the various nations that were under her dominion has not imposed important changes in the role of the Chilean Navy within the Chilean society. Traditionally the Chilean Navy, even though it has blue water capabilities, has faced primarily regional threats. It has been sized, structured, and trained to meet the nation's defense needs. However, the reader should not be misled about the nature of its mission, a short look at a map provides a clear idea about the dimension of the Navy's geographical environment. The creation of the concept of "Chilean Maritime Territory" introduced by the Commander in Chief of the Navy, already discussed in Section A of this chapter, provided an interesting challenge for the Chilean Navy to operationalize this concept in the coming years.

In fact, this vast extension of the "Chilean Oceanic Territory" has imposed additional duties on the Chilean Navy in the accomplishment of its tasks of providing protection to the

people who work at sea, exercising international maritime traffic control, and preserving the natural resources contained in that part of the Pacific Ocean [Ref. 22: pp. 19-23]. International law is clear in assigning specific tasks to coastal countries to ensure free and safe navigation, to safeguard sea life, and to prevent over extraction of natural resources from the sea. The Chilean Navy is not only continuously adapting to these requirements but also is continuously anticipating new demands. This means the necessity of an ongoing process of adapting operational capabilities to the new challenges. One recent example to illustrate this is the interest of the Chilean Navy in expanding operational capabilities through the acquisition or in home construction of new ships especially adapted and equipped to accomplish maritime surveillance.

Following the tendency of many countries in the world, and overwhelmed by the necessity to allocate more resources to social issues, the Chilean Navy is also subjected to constant threats of shrinking budgets, while it faces the aforementioned increasing operational demands. The Chilean Navy, as part of its continuous efforts to overcome this situation, has produced various improvements in its main processes by streamlining activities and focusing the use of the scarce resources to those areas with major power leverage in terms of improving operational capabilities. Two examples in which the Chilean Navy has leveraged the use of resources are investing in people and in novel processes oriented to develop its own weapon systems through an organized technology transfer process already discussed earlier in this chapter. Investment in people includes areas such as training, education, and welfare oriented to increase motivation and empower them to perform a better job.

D.   MANAGEMENT OF CHILEAN WARSHIPS

The environment within Chilean warships is a consequence of the Navy culture. In reality, it is difficult to separate the Chilean Navy culture from the warships environment. To be effective the hierarchical structure relies primarily on people and leadership. This approach is grounded in an implicit belief that if everybody just performs their duties as expected the entire ship will be successful. This includes people filling the highest positions onboard successfully managing their role of coordination and integration. In this sense, the main

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responsibility for leadership is to help subordinates to get the job done. They act mainly as coordinators and facilitators. The main assumption of this approach is that leadership is able to identify areas that need to be addressed through the use of cross-functional teams, that they are empowered enough to manage the teams' efforts, and that they are willing to accept the changes proposed by these teams though they might be detrimental for their aims. This is a valid issue in all of the various levels of the hierarchy onboard; from the XO to a petty officer in charge of a very specific section. This will be further explained in later sections.

The second assumption that arises from this approach is that for the system to function effectively people, say sailors and officers, need to perform their jobs in the right way and continuously strive to improve processes in which they are involved. This implies that individuals are motivated enough to do their best and that they have the education, training, support, and knowledge to effectively perform their job. In other words, the assumption here is that people are empowered enough to get the job done in almost any circumstance.

The third assumption with this approach is that leadership is always doing their best to coordinate and manage people and activities in such a way that the ship's goals are not only accomplished but also accomplished in the best way. This means that leadership is in fact motivated, charismatic, and prepared enough to perform their job, as leaders, effectively.

There is still another assumption around this approach; the system, depicted by organizational procedures, norms, and regulations, is aligned with the individuals, the environment, and the mission of the ship, so that people and leadership do not have constraints to do their best regarding the required activities to effectively accomplish the ship's goals and objectives. In other words, this means that the system not only does not constitute an obstacle for getting the job done, but is a strong support for individuals and leadership to pursue efficiency.

In the author's experience, while it is true that people and leadership are, in general, committed and empowered enough to do their best, it is also true that sometimes the system does put additional constraints on people trying to improve performance. In other words, in the author's opinion, there still are some problems associated with traditional organizations

that prevent the Chilean warships from engaging in a continuous improvement approach. The remaining paragraphs of this section review some of those barriers, focusing on issues which in some or other way are effectively addressed, at least in theory, by a quality management approach, like TQL.

The traditional hierarchical structure exhibited by the Chilean warships creates some barriers to upward and cross-functional communication. Actually two-way communication does exist between the commanding officer and his department heads. However, many times such communication does not exist between the department heads which results in suboptimization of the organization and sometimes even frustration among the crew members as they see that processes could be improved by simply increasing communication channels. Tasks demanding the participation of people from all departments such as damage control (DC) in combat positions is an example of a very important issue that sometimes is not addressed in a proper way due to the lack of communication among department heads who have to assign people to fill DC positions.

Managing the ship by departments without any additional team structure to deal with cross-functional processes increases the risk of creating "stove piping" management style around departments, thus reducing the ability of the crew to see and value their individual contribution to the whole system. Moreover, in some cases the crew feels that their efforts have little effect on the product or service that goes to the customer. Some hostilities arise among departments as its members are sometimes encouraged toward "we-they" thinking. In fact, sometimes, departments tend to blame each other for negative results. These barriers are much more obvious in the administrative organization of the Navy than in the operational organization. In the latter, there is less necessity for cross-sectional communication as each duty and station has been clearly assigned their specific tasks, and top leadership has been thoroughly educated on their responsibility for integrating and coordinating the information, activities, and eventually decision making.

Perhaps one of the main barriers existing in the Chilean Navy warships' environment is the tendency of leadership to blame people instead of the process every time a problem or

mistake arises. This issue is very difficult to overcome under the traditional approach of management. The bureaucratic structure is not flexible enough thus leaders try to enforce accountability through the chain of command, even though the problem most likely is in the process. This is also especially true in the administrative organization onboard warships. In the author's experience most of the time leadership recognizes, at least in part, that issue, but at the same time they find it easier to blame people. This is most likely because they can delay the necessity of dealing with the process which certainly is much more difficult. High turnover of leaders tends to amplify this problem as they expect to be transferred to other positions before the specific issue arises again.

The last main barrier to fostering continual improvement in the Chilean warship environment is the lack of authority possessed by those who fill the lowest position on the ship. People throughout the chain of command are not empowered enough to get things done in a smooth way without too much direct involvement of the supervisor. In this aspect, officers tend to concentrate the information and decision making. They do not trust enough in subordinates' capabilities to delegate most decisions. The result is that leaders, especially officers, are considered the bottleneck of the process, so that subordinates face basically two alternatives: try to come up with a decision on their own without having the expertise and information to do that; or do nothing until receiving an official decision about the problem at hand causing delay in the process. On the other hand, officers overwhelmed with the amount of outstanding decisions tend to delay some of them, or simply decide to adopt decisions without the required knowledge or information about the consequences. Moreover, as officers are continuously overloaded with trivial issues, they lack the ability to look ahead, prevent problems, or simply think strategically. This is usually true at all levels of the ship's chain of command, especially starting up from the division officers.

E.   TQL AND CHILEAN WARSHIPS

This section analyzes how a quality management philosophy, specifically TQL, fits in the Chilean warships environment. It is therefore a predicting exercise as the Chilean Navy has not yet embraced any specific quality management approach. The author judges

unnecessary to discuss one more time the advantages of the TQL approach in a warship as they were analyzed in-depth in the last chapter through its implementation onboard the USS Carl Vinson. In turn, it is more useful to analyze how the TQL philosophy fits with the Chilean Navy culture and to identify potential barriers to implementation given the Chilean warships' environment. The last part of this section discusses how close the Chilean Navy is today in applying quality management approach. This will be done by analyzing Deming's Fourteen Points as they are currently addressed onboard Chilean warships.

In general, an organization is actively interested in looking for changes, or specifically for alternative ways to management, if it faces one or more of the following situations: its outputs and/or outcomes are below expectations; some measures of effectiveness are below standards; there is a clear tendency of decreasing in general performance; it fails to deal with changes in environmental factors; or, if the change (i.e., a new approach) is forced by its upper level in the chain of command. Put it in the opposite way, an organization, especially if it is a bureaucracy, will be reluctant to accept changes if everything is functioning as expected, at least if that is the perception of its top leadership.

It is well known that historically the Chilean Navy has put maximum attention on accomplishing its roles in the best way and with minimum waste. However, in contrast to the private sector where the performance is measured through by preferences of the consumers, most public agencies, do not have a clear reference to measure their outcomes in terms of effectiveness and efficiency. This is most likely either due to the monopoly characteristic or because of the difficulty of an objective assessment of their outputs Moreover, it is more difficult to assess outputs for the military as the only effective measure is the result at an armed conflict. This fact raises the possibility of a difference between what an organization believes it is and what it really is. When this is the case, the overestimation of the own capabilities has been an important cause of huge disasters [Ref. 23: p. 127].

As a consequence, the international prestige gained through the years by the Chilean Navy [Ref. 34: p. 32] is not a guarantee to ensure success in the coming years. Today more than ever the external and internal environment are changing at an incredible pace; issues that

were unquestionable 20 years ago are not that true today. A clear example is the US economy which 40 years ago was unquestionably the largest exportation power in the world and today is reducing market share against countries that were totally ruined during WWII. Recent history has shown us that organizations have to evolve to seek and maintain a good fit with the continuously changing environment. Unfortunately, the main problems faced by organizations sometimes evolve slowly and, as a result, the perception of their actual seriousness is often hidden by other routine problems mainly originated by the lack of planning and a management style characterized by being reactive rather than proactive.

From the earlier discussion in this Chapter, two main issues arise as potential barriers to TQL implementation onboard Chilean warships. They are the resistance to change of the Chilean Navy members, especially senior leaders, and the potential negative effect that the establishment of a parallel organization could have in the regular chain of command. Both issues are crucial when comparing the U.S. Navy TQL approach with the Chilean Navy way of doing business. They affect not only to the Chilean warship environment but also to the Navy as a whole, therefore it is necessary to analyze both aspects in some detail.

In the author's opinion, the Chilean Navy, especially senior leadership, is resistant to accepting new management styles, programs, or philosophies, even more so if they come from an external environment and have not yet been proved effective. There is a consensual opinion in that the risks involved in any change often do not compensate the potential benefits. Under the current approach to management, the assumption is that if something is wrong then there is someone or some entity in the chain of command who is not performing as expected. That is, the issue is to find and punish the responsible party and then the mistake will not be repeated again thus bringing back the system to normality. On the other hand, the Chilean Navy periodically and systematically addresses some processes for improvements mainly when forced by new challenges. Under this environment, it is difficult for a new approach, like TQL, to be easily accepted by top management, in particular at the level of CO and the Fleet staff.

The second main problem for a good fit between TQL and the Chilean Navy culture is the potential negative effect that the establishment of a parallel organization could have in the regular chain of command. As described in Chapter II, the TQL philosophy, as well as any other quality management approach, requires the formation of various teams to monitor and manage the efforts to process improvement. The ESC, QMB's, and PAT's chartered to address some specific part of the process improvement effort form a sort of parallel organization within the ship that will interfere, supposedly in a positive way, with the regular chain of command. For example, if the ESC assisted by a QMB and a PAT decided to adopt a new procedure to deliver some service within the ship, even though some of the department heads involved in the process responsible for delivering that service does not agree with the changes, then those department heads are, at least, being challenged by subordinates who were originally in agreement with the decision and not with their superior's position on that topic. The magnitude of this negative effect will depend mainly on the extent that senior managers are willing to seek consensus on crucial issues. Under traditional management, if there is not consensus, the common superior resolves discrepancies without involving personnel from lower levels of the organization. In TQL that can still be the case but personnel at lower levels are allowed to contribute with information.

To complete the analysis of assessing how TQL would fit onboard Chilean warships' environment, here is a quick review of Deming's Fourteen Points as they might be currently addressed onboard Chilean warships, focusing mainly on the experience onboard the USS Carl Vinson. At this point, before finishing this chapter, the author wants to state clearly that the analysis and conclusions drawn in this chapter, especially in this section, should be validated by using alternative research techniques. One that should be useful in this case, is to conduct questionnaires addressed to a sample of the Chilean Navy members, randomly selected, oriented specifically to assess at to what extent the resistance to change and the risk of affecting the regular chain of command are effectively important barriers to allow a good fit between a quality management approach, like TQL, and the Chilean warship environment.

Point #1.   Create and publish to all the crew a statement of the aims and purposes of the organization. Top leadership must demonstrate constantly their commitment to this statement.

This point is currently addressed mainly through effective leadership onboard Chilean warships. Due to the education and training acquired at the Naval Academy and reinforced later while serving in the Navy, Officers are usually committed to motivating their subordinates by emphasizing the importance of their work and how their efforts contribute to the aim of the department and the ship. Most individuals onboard are really committed to perform a good job. However, Chilean warships do not have a formal planning process to create written statements, readily available for the crew, describing ship and departmental's mission, vision, and guiding principles, thus, reducing the ability of the crew, including top leadership, to make better decisions. Perhaps the main weakness with regard to this point is that among enlisted personnel the concept of leadership is weaker than at the officer level. Another weakness is that the ships lack in-depth analysis about products, services, and customers.

Point #2.   Learn the new philosophy, top management and everybody.

Though the Chilean warships are not committed to any specific quality management approach, they share many of the concepts of the TQL philosophy. Leadership pays attention to processes and looks for alternative ways of doing business to reduce waste and increase efficiency. This is especially true in the ship's operational organization where each station and control is continuously striving for improving performance by analyzing processes. The role of the XO and the Operation Officer to coordinate and integrate efforts among departments and operational controls, respectively, as clearly established in the Naval Ordnance, is an example of this point. Certainly, there are many concepts related to the TQL approach, such as the use of the PDCA cycle and other analytical tools, that if properly disseminated among crew members would help to achieve further improvements.

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<u>Point #3.</u>   Understand the purpose of inspections, for improvement of processes and reduction of cost.

Leadership onboard Chilean warships tends to analyze processes when products or services are rendered below expectations. The problem here is that they often lack the tools and a systematic methodology to effectively analyze processes for further improvements, especially in relation to data collection and statistical analysis. The result is that most of the time decision making is not based on data thus preventing the ship from making effective improvements. In general, traditional inspections do not ensure the ship effectively overcomes defects.

<u>Point #4.</u>   End the practice of awarding business on the basis of price tag alone.

In general, crew members on Chilean warships understand that the actual cost of a product or service is the total cost and not only the acquisition cost. This concept is known at the various levels of the hierarchy onboard the Chilean warships. However, in practice, the procurement system in the Chilean Navy presents some deficiencies because of the lack of communication between buyers and customers and between buyers and suppliers which can negatively affect the ship as the end-user of products and services. This issue is currently being addressed by various cross-functional committees and there are already some positive results from the analysis. The increasing incorporation of technical experts to the entities in charge of purchasing is an example of these results. One of the problems here is that the Chilean Navy is still dependent on various foreign suppliers who sometimes do not have a good representation in the country.

<u>Point #5.</u>   Improve constantly and forever the system of production and service.

The basic education of officers and enlisted personnel who serve onboard the Chilean warships is oriented to use the scientific method to approach problems arising in the workplace. This is because of the emphasis on a rational and systematic approach to face any type of problem put in the many courses they take during the educational process. However,

in author's experience, this characteristic of Navy officers in not enough to address effectively process improvement efforts. In fact, this point calls for the use of specific analytical tools to approach and monitor processes starting from a clear understanding of the concept of variation. The use of a general scientific approach does not ensure continuous process improvement. Moreover, sometimes it could be frustrating for the personnel to apply this approach without focusing in what is really important to produce positive outputs and to effectively monitor the process being improved. Summarizing, though Chilean warships tend to use the scientific method as a general approach to face problems arising onboard they lack knowledge of operational tools, such as the concept of variation and the use of the PDCA cycle, to systematically approaching and monitoring process improvement efforts.

Point #6.   Institute training (for skills).

Training is one of the first priorities for the Chilean Navy. This effort includes training for the routine job as well as for operational duties. The Navy is equipped with excellent trainers located in shore facilities ranging from machinery control room to complex tactical simulators to training operational teams from the ships. In addition, the training process is continuously being enhanced to ensure crew members are always trained to perform their job even if they are facing new responsibilities. As William C. Byham quoted, "The only way to get people to adopt constant improvement as a way of life in doing daily business is by empowering them" [Ref. 32: p. V]. To this purpose, empowering means to provide sailors with the required training to get the job done. Of course, there is no specific training related to process improvement as the Chilean Navy has not adopted any quality management approach yet.

Point #7.   Teach and institute leadership.

This point should be the strongest in the Chilean warships as officers are prepared to exert leadership from the very beginning of their career. Every Navy officer has a clear understanding on the concept of leadership both in theory and in practice. They are prepared

for four or five years at the Naval Academy and then they have the opportunity to improve their abilities as leaders during their career. Actually, the Chilean Navy emphasizes leadership in many ways such as periodic and specific written orientations (i.e., letters or articles) provided by the Commander in Chief of the Navy and other senior admirals addressing various aspects of what is understood by a good leadership. The Chilean Navy has always understood leadership to be what is promoted under TQL, such as the leader as a coach and a counsel rather than a judge. Perhaps the main problem is at the lowest level of the chain of command as sometimes junior enlisted do not have a good understanding of the concept of leadership. This could be remedied by providing more opportunities to those personnel to practice leadership and by extending the span of authority to make decisions by their own.

Point #8. Drive out fear. Create trust. Create a climate for innovation.

In the author's opinion this is a crucial point that needs to be addressed in more detail to gather more objective information. However, according to the author's experience of the environment onboard the Chilean warships, fear is not a serious barrier. If sometimes sailors do not pass up the chain of command the bad news or their concerns it is simply because they do not always trust that those problems will be treated and/or solved appropriately. That is not fear. On the other hand, if top leadership sometimes is not willing to pass up some problems to the Navy hierarchy it is mainly due to a combination of the reward system, the annual rating system, and the promotion system that the Navy has been using for years. Experience from various studies performed in the Chilean Navy shows that this problem is not easy to solve in practice.

Point #9. Optimize toward the aims and purposes of the ship the efforts of teams and groups.

As the Chilean Navy is not committed to any quality management philosophy, the creation of teams onboard is mainly to address specific problems such as welfare related issues rather than to deal with process improvements. Of course, this teamwork approach is

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not as good as the TQL team structure presented in previous chapters to pursue continuous improvement because of the lack of a systematic approach to select process to be addressed by using Pareto charts or other techniques, thus, increasing the risk in focusing on processes that are not important to the ship or department's mission. In fact, according to the author's experience teams created onboard Chilean warships are often very effective in addressing the specific task they were chartered for. However, there is often a significant possibility of suboptimization across the entire ship and the potential for negatively affecting other processes onboard. In addition, the annual rating system constitutes an obstacle to encouraging the win-win thinking as each individual, entity, or department wants to excel even at the expense of other departments or the ship as a whole.

Point #10. Eliminate exhortations for the workplace.

This issue is addressed with criterium and common sense by leadership onboard Chilean warships. In general, there are no slogans spread throughout the ship other than the Navy's official "motto" which say: "Honor and Glory. Efficiency and Discipline." On the other hand, if it is true that division officers, department heads, the XO, and the CO sometimes exhort the crew to do their best, especially before a formal inspection or an operational deployment, it is also true that leadership understands that this exhortation should be carefully managed to avoid transforming them in a negative tool, at least in the sailor's perception. Summarizing, Chilean warships address this point properly according to Deming's philosophy.

Point #11. Eliminate numerical quotas and management by objective (MBO). Instead, learn and institute methods for improvement and learn the capabilities of processes and how to improve them.

Management by objective is the best expression to describe the way the Chilean Navy conducts business onboard its warships. In fact, there is a generalized belief that this management style allows maximum latitude to subordinates to accomplish their obligations as they judge better. The slogan is: "this is the objective or the goal and you figure out how

to accomplish it." In theory this is true, however, when a leader assigns a duty to a subordinate he should make sure that the receiver of the order is able to accomplish the task. In the author's experience, there are often other factors that preclude subordinates in Chilean warships to perform according to expectations. System's weaknesses and lack of experience and/or training are the main obstacles for the subordinate to accomplish the task. In addition, standards and goals are often set without knowledge of process capability. In fact, it is difficult to recognize the process capability without a clear understanding of control charts and common and special causes of variation. Bringing equipment to manufacturer standards without enough resources to do that is an example of objectives established by leaders onboard Chilean warships. This accomplishment is sometimes difficult for subordinates because they have to face issues that are beyond their control.

Point #12.   Remove barriers that rob people of pride of workmanship.

Annual performance appraisals and sometimes management by objectives are the main barriers in the Chilean Navy that rob sailors of pride of their work in Chilean warships' environment. Goal setting without considering process capability is a good way to deter sailors from taking pride in their job as they cannot solve problems beyond their scope. In other words, if the problem is in the process the sailor can do little to successfully find a solution. On the other hand, Chilean Navy current rating system forces performance into a frequency distribution so that most people fall in the middle. However, most people believe they are above average reducing motivation to better performance thus building up a barrier for people to take pride of their job. Here again the author wants to emphasize that this issue is not easy to solve in practice, according to the Chilean Navy experience.

Point #13.   Encourage education and self-improvement for everyone.

There is little chance to engaging any educational program for crew members other than some special courses by mail offered by the Navy Educational Directorate. Some sailors enroll in vespertine courses at private institutes but regular duties onboard make it very

difficult for them to complete their studies. However, in thinking of the Navy as a whole, people have the opportunity to self-improvement; the Navy sees education as an investment rather than an expense as evidenced by the continuous efforts developed by the Personnel Directorate sponsored by the Commander in Chief of the Navy to increase the educational level of the Navy personnel already explained earlier in this chapter. As a summary of this point, the author believes sailors at Chilean Navy warships have the educational level required to foster innovation and creativity in the workplace. In general, they are self-motivated and/or motivated by leadership to improve their educational level thus everyone is well prepared to assimilate changes in process and technology.

Point #14. Take action to accomplish the transformation.

This point is not applicable to the Chilean Navy as there is no intention to date to adopt any new philosophy related to quality management, like TQL, especially onboard the warships. If they decide to adopt it, there are some conclusions from the analysis of the first thirteen points that should alert the Chilean Navy as to clearly identify issues that are supportive of taking action and others that would create barriers to implementation. Benefits from a comprehensive planning process to management onboard and the outcomes obtained from a systematic approach to process improvement are good examples of issues that are supportive for taking action. Conversely, resistance to change, long delay in obtaining positive outcomes, and the difficulty of creating a critical mass in the fleet are good examples of barriers for taking action in the hypothetical transformation process onboard Chilean warships.

F.   CONCLUSIONS

The following are conclusions as to the applicability of a quality management approach, like TQL, onboard Chilean warships. It takes into consideration the Chilean warships environment and TQL discussed in this Chapter and the experiences from the TQL implementation process onboard the USS Carl Vinson discussed in the last Chapter. Conclusions have been grouped in supportive and not supportive to TQL depending on

whether the conclusion about the Chilean Navy agree or does not agree with a quality management approach like TQL.

1.   Supportive to TQL

-    The Chilean Navy culture is characterized by a strong commitment to keeping traditions and transferring moral values and Christian principles to its members, emphasizing their humanistic formation. The belief is that if people are strong in their formation, they would be able to make sounds decisions in any situation, thus allowing the Navy to success.

-    The Chilean Navy is a highly disciplined and hierarchized organization which relies mostly on top-down communication, emphasizing the use of written regulations to standardize behavior among its personnel, especially those filling the highest positions.

-    The Chilean Navy, though strongly committed to keep traditions, values, and principles has been very responsive in adapting to new scenarios. This is especially true at the highest levels of its organizational structure.

-    Leadership is considered as one of the cornerstone of the Chilean Navy to conduct business. The main role of the Naval Academy is to prepare leaders for commanding people within the warships environment. In addition, the Chilean Navy is continuously seeking ways to keep this concept updated and alive in the soul of its members.

-    The educational process plays an important role in shaping Chilean Navy culture. Navy Officers are all graduated from the same institute, the Chilean Navy Academy, acquiring a similar and standard formation as seamen. Traditions, moral values, Christian principles, and leadership are the main concepts learned and internalized at the Naval Academy.

2.   Not Supportive to TQL

-    The Chilean Navy is facing a new scenario for the next century, characterized by reducing budget and increasing operational demands, in addition to the traditional roles, such as ensuring free and safe navigation, safeguarding sea life, and preventing over extraction of natural resources from the sea throughout the broad maritime spaces where Chile has certain rights and duties according to the international maritime law.

- The rigidity of the Chilean Navy hierarchy relies heavily on people and leadership to be effective. For this approach to be successful Navy personnel should be empowered enough to accomplish their tasks, the system should not constitute an obstacle for them to perform in a proper way, and leadership should have the ability to effectively coordinate and integrate activities toward the aims of the ship. If any of these assumptions fail then the Navy as an organization may fall into troubles.

- The rigidity of the traditional hierarchical structure exhibited by the Chilean warships, the sometimes "stove piping" departmental organization structure existing onboard, the lack of a systematic methodology to deal with process improvement, and the tendency of top leadership to concentrate the information and the decision making are obstacles that would prevent the Chilean warships from being successful in a TQL environment.

- The monopoly character of any Navy that precludes it to know with a reasonable certainty its efficiency and effectiveness, the resistance to change especially of senior leadership, and the potential negative effect that the establishment of a parallel organization could have in the regular chain of command are issues affecting the ability of the Chilean Navy to embrace a quality management approach like TQL.

- Though the USS Carl Vinson's transformation process is still in its infancy, the advances exhibited as to-date permit to assert that the parallel organization conformed by the TQL team structure does not affect the regular chain of command but rather reinforces it. Decision making is more effective and reliable as there is more objectivity in the process. This, in turn, strengthens leadership, thus reinforcing the chain of command at the various levels of the ship organizational structure.

- The resistance to change encountered in the Chilean Navy is also present at the level of middle management onboard the USS Carl Vinson. Though the nature of this phenomenon is different in each case, the remedy is the same; learning and training on TQL philosophy. In fact, all of the apprehensions from Chilean Navy senior leaders find a good response in the Deming's approach to quality management. To help overcome this issue, the USS Carl Vinson is offering onboard TQL training.

- In Chilean warships, as well as in the USS Carl Vinson, most of the problems reside in the system. The difference is that leadership onboard the USS Carl Vinson understands that and they are committed to accept

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that reality and work on process improvement following TQL methods and procedures. In opposition, there is no evidence that senior leaders in Chilean warships understand or accept this concept as a fact according to their management style.

VI. FINAL CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the main findings and provides comprehensive answers to the research questions established in Chapter 1. Recommendations are also included for hypothetical future implementation of any quality management approach, like TQL, by the Chilean Navy. Areas deserving future research are also identified.

A. FINAL CONCLUSIONS

The following conclusions, attempted to provide comprehensive answers to the research questions, have been grouped by research question as they were established in Chapter I, Section C.

<u>Research Question #1.</u>   Is it possible to successfully implement TQL onboard a warship?

1. The experience from the TQL implementation process onboard the USS Carl Vinson has proven successful as many positive outcomes have resulted from the application of TQL. However, the pace of the transformation process has been slower than expected as in warships environment there are additional difficulties such as high turnover of personnel, too many high priority and ever changing operational demands, difficulty in identifying customers for the various products and services, and the existence of many standardized procedures that prevent ships from speeding up the process.

2. The strong commitment of the Commanding Officer to TQL implementation onboard his ship is by itself a demonstration that the ship is benefiting from the process. Although he clearly understands that the transformation will not occur overnight Captain Baucom focuses on the long term results.

3. Crew involvement in various teams chartered to analyze and improve processes has enabled sailors to make meaningful contributions to their work as they are encouraged to provide their best ideas, skills and efforts to the good of the department or the ship. Responses from the crew questionnaire indicate that in sailors' perception leadership is effectively using teams to address specific processes and that sailors are willing to participate in those teams.

Research Question #2.   What are the main positive outcomes after implementing
                         the TQL philosophy onboard the USS Carl Vinson?

1. The main positive outcomes of the TQL implementation process onboard the
    USS Carl Vinson are: (1) some interesting and complex processes already
    improved by using TQL; (2) the benefits of crew involvement in decision
    making through the use of a teamwork approach to solve problems; (3) the
    effective use of a structural approach to improve field processes through the use
    of TQL methods and techniques; (4) improvements in the ship's atmosphere as
    sailors perceive a positive change in the management style of supervisors and
    top leadership; and (5) the synergy produced through the coordination of the
    crew's efforts toward departmental and ship's goals as a consequence of the
    formal planning process.

2. Increasing customer satisfaction through the reorganization of the spaces and
    services performed by the personnel working in the Administrative and
    Personnel Office and the changes introduced to the weapons qualifications
    program are two examples of processes effectively improved by using TQL
    methods and techniques.

3. Many field processes have been improved onboard by effective use of TQL
    methods and techniques. Though the ship lack knowledge and expertise in the
    use of these procedures, they are currently addressing various processes by
    using some helpful TQL techniques both by departmental QMBs as well as by
    strategic committees chartered by the ESC.

4. Under the new management approach, leadership onboard the USS Carl Vinson
    is responsible for having created the proper atmosphere to foster
    communication and feedback among the crew. According to the responses to
    the crew questionnaire there is a proper climate onboard the ship to foster
    innovation and people do not feel fear to pass up the chain of command the
    "bad" news that require upper level involvement.

5. The formal planning process onboard the ship which main outputs are the ship
    and departmental's mission, vision, and guiding principles statements have been
    helpful for the crew to perform better upon understanding how their daily work
    contribute to the department or ship's goals. This, in turn, has generated a
    synergy as individual and departmental's efforts meet together toward the aim
    of the ship.

<u>Research Question #3.</u>   What are the main obstacles in implementing TQL onboard the USS Carl Vinson?

1.   The main obstacles for TQL implementation onboard the USS Carl Vinson are lack of TQL training especially of senior enlisted personnel, the high turnover of personnel which reduces the ability of the ship to control the transformation process as most of the new personnel lack experience and training on TQL, formal inspections tend to prevent the ship from focusing primarily and consistently on the most important processes as the crew has to concentrate their effort on passing the inspection, and operational requirements driven by the operational cycle put an additional constraint to speed up the implementation plan as they sometimes postpone efforts toward the transformation process.

2.   Lack of training of senior enlisted personnel creates a resistance to change in them causing an interruption in the chain of command at the level of supervisors which negatively affects the ability of the ship to advance faster in the transformation process.

3.   The high turnover of personnel is another obstacle to TQL implementation as many of the already trained personnel is commissioned to other commands bringing with them all the TQL experience and training acquired onboard the ship. Of course, most of the time new personnel arriving to the ship have little training and experience on TQL.

4.   Formal inspections prevent the ship from focusing in the long range results as the crew has to deal with many details well before the inspection to ensure success, thus postponing the important issues that should be addressed with a higher priority.

5.   Operational requirements, mostly driven by the operational cycle, make more difficult for the ship to concentrate efforts on the TQL implementation process as they have higher priority and often require the involvement of the key personnel onboard the ship. However, as long as the ship increases their commitment to the transformation process, TQL will be a way of life in doing business onboard, thus helping the crew to meet operational requirements.

6.   Some department heads exhibit higher resistance to change toward the new philosophy. This constitutes an obstacle to TQL implementation as those leaders set the compass for their subordinates, thus having a multiplying negative effect as they are not willing to accept the change. From responses to written questionnaires addressed to selective top leadership, departments having

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more technically oriented jobs which are well structured and procedure conscience are reluctant to change tried and true methods.

<u>Research Question #4.</u>   What are the main experiences from the TQL implementation process onboard the USS Carl Vinson for future applications in Chilean warships.

1.   The Chilean Navy is also facing a new scenario characterized by increasing operational demands at reducing costs. This sets a challenge for the Chilean Navy as to look for alternative ways to increase efficiency and effectiveness. A quality management approach like TQL provides the opportunity to improve the ability of any organization in delivering products and services by focusing on processes that make up the system. It is no more sufficient to ask people to perform better; Chilean Navy personnel are among the best in the country. However, it is really possible to design better systems and organizations and to train leaders to empowering their subordinates and to removing the obstacles that prevent them to perform better.

2.   The current Chilean Navy culture and its warships environment have a good fit with the TQL philosophy. This means that keeping traditions, forming people with a solid humanistic base, relying on discipline and leadership, and having an educational process which provides standardized moral values to the Navy personnel are in alignment with the TQL culture. Perhaps the toughest issue is to fit the team-based approach of TQL with the Chilean warships current hierarchical management style.

3.   The main experiences from the TQL implementation process onboard the USS Carl Vinson for future application in the Chilean warships are:

     -   Top commitment and TQL training are the key issues to success in the transformation process.

     -   It is advisable not to rigidly force the TQL implementation plan in a ship or in a department but instead focus on planning the transformation process by allowing people, especially top leadership, to learn and experience on the new philosophy.

     -   Data-based decisions tend to strength leadership and consequently the chain of command as they increase the validity and reliability of those decisions on the subordinates' perception.

- Once again the experience of the USS Carl Vinson demonstrate the effectiveness of focusing on processes which are simple and adequate to be treated by using TQL methods and techniques. The false start reminded the ship of this.

- It is strongly advisable to conduct periodic surveys addressed to the crew to obtain first hand information about the management status of the ship. Many of the issues addressed by the ship using TQL have been detected through the analysis of written questionnaires conducted to know the current level of customer satisfaction.

- TQL has provided the ship with a structured and systematic methodology to address process improvement efforts. The experience in the USS Carl Vinson shows that it is difficult to find another approach as effective to select processes, identify problems, and follow the PDCA cycle for process improvements.

- Though the USS Carl Vinson's ESC assigned broad latitude to the department heads to implement TQL at their own pace, the various teams chartered to deal with process improvement have helped the ship to foster top-down communication and coordination among departments.

B. RECOMMENDATIONS

The recommendations included in this section are addressed only to the Chilean Navy. Other recommendations useful for the USS Carl Vinson are implicitly included in chapter IV. The author deliberately has not wanted to include these recommendations in this chapter as they are beyond the objectives of this thesis.

1. The Chilean Navy should study in depth the elements and fundamentals of a quality approach like TQL. This should be considered as an opportunity for senior leaders to explore new approaches that could lead the Navy to higher levels of performance. To this purpose, the US Navy constitutes an excellent laboratory to conduct further research on this topic. The caution is that TQL should be viewed as a philosophy instead of as a plan or a program and should also be viewed in context; that is as the US Navy approach to quality management but having taking into account that this approach is but only one for quality management.

2. If the Chilean Navy decided to adopt a quality management approach like TQL it is highly recommended to start with TQL education at all the levels of the Navy hierarchy, especially among senior leaders. It is much more important to start with a very slow pace but over solid foundations than to force the transformation process from the top. If not committed with the quality management approach, the human being will most of the time find a way to delay the transformation process as far as he or she wants. The focus is to penetrate the mind of the people with this new approach and then everything will result easier.

3. A diagnosis of the current status of the Chilean Navy is a good way to start thinking of any change to quality management. A word of caution here is that any research technique used to gather information such as personal interviews, written questionnaires, and climate surveys should be wisely designed and then administered to increase the validity and reliability of the information relevant to the objective required to be measured.

4. Finally, the author strongly recommends that the Chilean Navy does not start any quality approach like TQL as a pilot or demonstration program until the Navy as a whole is prepared to engage in a transformation process which literally means a radical change in the way the organization conduct business. Moreover, in the author's opinion, any TQL false start in the Chilean Navy could mean to stop thinking again in a quality management approach for a long period of time.

C. AREAS FOR FUTURE RESEARCH

The author identifies two major areas deserving further research which would be helpful to strengthen, change, or weaken some of the answers provided by this thesis to the research questions established in Chapter I, Section C. The first area relates to the three first research questions and consist of performing a follow up to the USS Carl Vinson TQL implementation process. Similar techniques used in this thesis could be utilized to further research the transformation process evolvement onboard that ship to analyze the dynamic of the change. It would be also interesting to perform a case study onboard another ship of the USS Navy to compare results.

The second major area suggested for further research relates to the fourth research question and consist of increasing the reliability and validity of the analysis performed to the

Chilean Navy culture and its warships environment. To this purpose, it would be helpful to utilize written questionnaires, further literature review, and climate surveys addressed to a sample of the Chilean Navy personnel, including senior leaders, to further analyzes the fitness between a quality management approach like TQL and the Chilean Navy warships environment. This is especially recommended if the Chilean Navy decides to consider any quality management approach to be applied in the future.

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APPENDIX A. GLOSSARY OF TERMS

accountability: From accountable: subject to giving account or answerable. Those who are responsible are also accountable--although the reverse may not be true. <u>Webster's New Collegiate Dictionary</u>.

Act phase: The fourth phase of the Plan-Do-Check-Act cycle (PDCA). Decisions are made as whether to adopt the changes that were tested, propose new changes, or run through the cycle once more.

assessment: (Also, **organizational assessment.**) A systematic method of determining the state or condition of something which involves the collection, analysis, and interpretation of data. See also **surveys.**

baseline data: Information about a process that is collected repeatedly over a period of time prior to introducing a change.

basic graphic tools: Charting and graphing procedures that are commonly used to depict process performance in Total Quality Leadership. These tools assist in describing processes, identifying areas for improvement, and indicating the effects of changes. The seven most commonly used tools include: flow charts, cause-and-effect diagrams, Pareto charts, control charts, run charts, histograms, and scatter diagrams.

bureaucratic hierarchy: A form of organization and management characterized by specialization of functions, adherence to fixed rules, and a hierarchy of authority. <u>Webster's New Collegiate Dictionary</u>.

capable process: When a process is stable and the measures fall within specification limits (customer requirements), the process is said to be capable. When measures in a stable process fall outside specification limits the process is said to be non-capable. Note: The capability of a process cannot be determined unless the process is stable (in statistical control).

causal system: The combination of influences or sources of variation that determine the nature of an output characteristic at a point in time.

cause-and-effect diagram: A diagram that shows the different factors or causes of a certain effect and how they can be categorized. Also called a **fishbone diagram** (after its appearance) or **Ishikawa diagram** (after its developer).

chain of command: A series of positions in an organization ordered by level of authority.

chain reaction: The effect that results from reducing variation in organizational processes. The result is higher quality, decreased costs, improved productivity, better competitive position, staying in business. and more jobs. [cf. Deming, 1986]

charter: (noun) A written document that describes the boundaries, expected results, and resources to be used in a quality improvement project.

Check phase: The third phase of the Plan-Do-Check-Act cycle (PDCA). The effects of having made a change are studied and assessed during this phase.

Command Trainer: A representative from a command sent to receive training in one or more of the DON TQL courses, and qualified by virtue of this training to provide these courses to members of his or her command. Representatives are usually **total quality coordinators** or **quality advisors.**

common causes: Those causes that are inherent in the process over time, affect everyone working in the process, and affect all outputs of the process. [cf. Moren et al., 1991]

control chart: A graph that compares samples of process performance to a statistically predicted range of performance derived from the process. The unique feature of the control chart is its ability to form data into patterns which, when tested statistically, can lead to information about the process.

control limit: A line (or lines) on a control chart used as a basis for judging the significance of the variation in a process. Variation beyond a control limit is evidence that special causes are affecting the process. Control limits are calculated from process data and are not to be confused with engineering specifications.

critical mass: Critical mass for quality improvement is achieved when an irreversible change in movement towards total quality transformation has been achieved. It is dependent upon those people within an organization who possess sufficient knowledge, power, and leadership to initiate and sustain a cultural change.

cultural transformation: See **organizational culture, organizational transformation.**

customer: The person or group that establishes the requirements or expectations of a process and receives or uses the output of that process. **External customer:** An individual or group outside the boundaries of the producing organization who receives or uses the output of a process. **Internal customer:** An individual or group inside the boundaries of the producing organization who receives or uses the output of a process within the organization.

customer-supplier relationship: That relationship between an individual or group that establishes, receives, uses, and judges the output of a process, and the individual or group that provides that output which serves as the user's input.

data-based decision making: A decision-making process based on facts and/or other objective information as opposed to intuition or hunches. [cf. Scholtes et al., 1988]

defect: Any state of unfitness for use, or nonconformance to specification, e.g., oversize, low mean time between failures, poor appearance. [cf. Juran, 1974]

delegation: The act of empowering to act for another. Webster's New Collegiate Dictionary.

detection method of quality control: The traditional method for quality control in which quality is achieved through inspection after production. [cf. Sullivan, 1986]

diagnosis: The process of studying symptoms, taking and analyzing data, conducting experiments to test theories, and establishing relationships between causes and effects. [cf. Juran, 1974]

Do phase: The second phase of the Plan-Do-Check-Act cycle (PDCA). Changes, expected to improve processes, are tried or made during this phase.

downstream customer: An individual or group that receives its input later in the process flow following one or more intermediate steps in the process.

downward link: An ex officio member of a **(team)** who comes from a higher order QMB or the ESC and who is principally responsible for interpretation of the QMB charter and for helping the QMB with actions required from higher in the chain of command.

end-user: An individual or group that receives and uses the output of a process.

end-user (DON): The ultimate user of products and services in the DON is the Sailor and Marine. Everyone in the Navy and Marine Corps (whether in operational functions, direct support functions, headquarters, etc.), must recognize their responsibility ultimately to contribute to the operational forces. [cf. Garrett, 1990]

Executive Steering Committee (ESC): The highest level quality improvement team in a command. Chaired by the TQL Leader, it is composed of most, if not all, of the members that report directly to the Commanding Officer. This top level team develops the new quality leadership philosophy, develops written TQL strategic plan, identifies and removes impediments to the new philosophy and plan, identifies initial process improvement opportunities, charters QMBs, provides resource and decision support to QMBs, and establishes organization positions to support the quality transformation. Non-members, such as labor representatives and the TQ Coordinator, can also attend meetings of the ESC.

Executive Steering Group (ESG): The executive-level team chaired by the Under Secretary of the Navy and made up of the top leaders in the DON. It was chartered by the Secretary of the Navy in 1989 to lead the quality transformation in the DON. The DON ESG is responsible

for developing the new quality philosophy and developing and deploying the DON's strategic plan.

extended system (or process): The extended system is a term that reflects the system view that an organization involves more than the elements within its own boundaries; it includes elements "external" to its boundaries such as external suppliers and customers.

feedback system (customer): A system for obtaining information from customers about relevant quality characteristics of products and services. **Passive feedback system:** Feedback is voluntarily supplied by the customer or user, There is no requirement to provide feedback. **Active feedback system:** The supplier actively seeks and acts upon information from the customer on a continuing basis.

flow chart: A schematic diagram that depicts the nature and flow of the steps in a process.

goal: A major output or outcome towards which efforts are directed, is measurable and desired.

guiding principles: A set of statements about the values and philosophy of an organization that guide the behavior of its members toward each other, toward customers and suppliers, and the way the organization approaches its work. Sometimes presented as an organization's "philosophy of operations," or its "credo."

histogram: A vertical bar graph that depicts the distribution of a set of continuous data.

ideals: Those ends that are believed to be unattainable but towards which we believe progress is possible during and after the period planned for. [cf. Ackoff, 1981]

implementation guidelines: A set of specific activities used to facilitate the implementation of TQL in an organization. They represent the "best" assessment of what is required to successfully begin implementing TQL within a setting defined by a needs analysis. They are based on TQL requirements, an analysis of the organizational change literature, a review of organizations practicing quality improvement, and the unique characteristics and requirements of DON organizations.

implementation plan: A plan for starting total quality implementation in an organization, with the aim of establishing critical mass to begin the organizational change. The plan contains a list of actions that are sequenced with time lines showing their starts and durations. It may also identify the relationship between implementation actions and what individuals or groups in the organization are responsible for carrying out the actions.

innovation: From the TQL perspective, this term refers to the application of knowledge that leads to the development of new processes, products, or services.

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leadership: "Leadership is the art of influencing people to progress towards the accomplishment of a specific goal." [NAVEDTRA 100054 Basic Military Requirements]

linking pin: Concept developed by Likert [cf. Likert, 1961] A linking pin is anyone who belongs to two groups within the same organization, usually as a superior in one and as a subordinate in the other [cf. Shafritz, 1980]

management by objectives (M.B.O): Management by objectives is a process that specifies that superiors and subordinates will jointly set goals for a specified time period and then meet again to evaluate the subordinate's performance in terms of the previously established goals. [cf. Gibson et al., 1976]

management of participation: The boundaries, limits or controls placed upon participative management. In TQL, participation on PATs and QMBs is directed by higher authority rather than through voluntarist.

mission: An organization's mission is an enduring statement of purpose which describes what the organization does, who it does it for, and how it does it.

mission statement: Defines the fundamental, unique purpose that sets a business apart from other firms of its type and identifies the scope of the business's operations in product and market terms. It provides the foundation for priorities, strategies, plans, and work assignments. It is the starting point for the design of leadership jobs and structure. It specifies the fundamental reason why an organization exists. [cf Pearce, 1987]

objectives: Specific, measurable mid-term and short-term performance targets necessary for achieving long-term strategic goals.

operational definition: A definition that gives communicable meaning to a concept by specifying how the concept is measured and applied within a particular set of circumstances. The operational definition will change depending on the application.

optimization: Optimization is a process of orchestrating the efforts of all components toward achievement of the stated aim. [cf. Deming, 1991]

organizational culture: A pattern of basic assumptions, invented, discovered, or developed by a given group, as it learns to cope with its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore is to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. [cf. Schein, 1990]

organizational transformation: Organizational transformation is the result of making fundamental changes in the strategies, design, and management of an organization.

outcome: The way the customer responds to the product or service.

output: The result of the organization taking inputs and transforming them into products or , . services.

paradigm: A set of rules based on an explicit or implicit set of assumptions that explains how things work or ought to work.

paradigm shift: A change in the way one perceives the way things work or ought to work.

Pareto chart: 1. A vertical bar graph that displays categories in decreasing order OI of frequency or magnitude from left to right. 2. When used for causal analysis, it enables ready identification of the few vital problems as contrasted to the many trivial ones.

performance appraisal: Title usually given to the formal method by which an organization documents the work performance of its employees. It is designed to serve a variety of functions: 1. changing or modifying dysfunctional work behavior; 2. communicating to employees managerial perceptions of the quality and quantity of their work; 3. assessing future potential of an employee in order to recommend appropriate training of developmental assignments; 4. assessing whether the present duties of an employee's position have an appropriate compensation level; 5. providing a documented record for disciplinary and separation actions. [cf. Shafritz, 1980]

performance goals: A major individual or organizational output or outcome which results from performance and is measurable, and desired.

Plan phase: The first phase of the Plan-Do-Check-Act cycle (PDCA). A plan identifying what needs to be improved, how it is to be implemented, and how the results are to be evaluated is developed during this phase.

Plan-Do-Check-Act (PDCA) cycle: The systematic approach used to guide managers to quality. Also known as the Shewhart or Deming cycle. It is a scientific method useful for organizational decision making. The initials refer to specific phases that occur during this process: Plan-Do-Check-Act.

planning assumption: An expectation about how future events, both internal and external to the organization, are likely to affect the achievement of desired results. These assumptions are taken into account during the planning process and may affect the actual goals, objectives, and strategies adopted by the organization.

planning hierarchy: The four types of planning--operational, tactical, strategic, and normative--are obviously increasingly general. Operational planning is not only of the shortest range but it also tends to focus on small subsystems of the organization planned for and to deal with them independently. Tactical planning has an intermediate-range perspective and deals with the interactions between subsystems and their interactions with the organization as a whole. Strategic planning is longer-range and encompasses not only internal relationships but also those between the organization as a whole and its "transactional" environment, that with

which it interacts directly and on which it has some influence. Normative planning is indefinitely extended and deals with all internal and external relationships including those between the organization and its contextual environment, which it has no influence over but which influences it. [cf. Ackoff, 1981, p.65]

President's Award for Quality and Productivity Improvement: This award is given by the Federal Quality Institute to government agencies that show great progress in quality. It is the federal equivalent of the Malcolm Baldrige National Quality Award that recognizes quality initiatives in private industry.

prevention method of quality control: The method for quality control in which quality is achieved by process control and improvement which results in reduced process variation.

process: A set of causes and conditions that repeatedly come together to transform inputs into output. The inputs may include people, methods, material, equipment, environment, and information. There can be several stages to the process, or each stage could be viewed as a process. The output is a product or service. [cf. Moen & Nolan, 1987]

Process Action Team (PAT): A PAT is a team that is chartered by a QMB to assist in achieving process stability for a particular measurement being used by the QMB. The team collects process data and seeks to reduce variation associated with special causes, and waste associated with complexity and/or causes of rework. Once stability is achieved, formal team meetings may no longer be required and the PAT may disband. Data collection procedures continue, however, in order to support the needs of the QMB.

process analysis: A collection of procedures for determining the relative contributions of causal factors or variables on the output or outcome of a process.

process improvement: The continuous endeavor to learn about the cause system in a process, and to use this knowledge to change the process to reduce variation and complexity and to improve customer satisfaction. [cf. Moen et al., 1991]

process management: Actions taken everyday to ensure that the right tasks are identified and performed in the way they were intended and improved at every opportunity to meet customer expectations.

product: A product is the output of any process and may be classified as (a) goods (pertains to physical things such as automobiles, television sets or rotor blades), (b) information (as in conversations, annual reports, plans, advice), or (c) services (work performed for someone else such as recruiting, transportation, or plant maintenance). [cf. Juran, 1989]

production control: Systematic planning, coordinating, and directing of all (manufacturing) activities and influences to ensure having goods made on time, of adequate quality, and at reasonable cost. Webster's New Collegiate Dictionary.

productivity measurement: Indices that reflect an organization's efficiency. These indices are usually reported as an organization's ability to provide various outputs per unit of time or cost.

profound knowledge: Profound knowledge is (a system of knowledge of) the requisite theory necessary to enable and facilitate the process of learning and understanding how to improve the quality of product and process. It consists of four interdependent parts (disciplines): systems theory, statistical theory, psychology, and the theory of knowledge. [cf. Anderson et al., 1990, May]

programmatic change: Organizational change focused on improving one specific area of performance, having specific measurable results, usually under the direction of a program manager, and generally not integrated with other improvement efforts or the general conduct of organizational work.

QMB structure: The QMB structure is composed of the members of a QMB, plus a representative from a higher level QMB (or the ESC), and team leaders of subordinate QMBs (or PATs). Thus composed, a QMB can have three levels of management (facilitating vertical integration), as well as being cross-functional (supporting horizontal integration).

quality: A characteristic or the value of a product or service from the perspective of the user. The extent to which a product or service meets or exceeds customer requirements and expectations. Good quality does not necessarily mean high quality. It means a predictable degree of uniformity and dependability at low cost, with a quality suited to the market. [cf. McConnell, 1988]

quality advisor: See also **command trainer.** Assists QMBs and PATs in process analysis and data interpretation. Trains these teams in methods and tools for process improvement and the use of graphic methods, and assists them in documenting their findings.

quality audit: An independent review conducted to compare some aspect of quality performance with a standard for that performance. The term "independent" is critical to the concept of audit and is used in the sense that the reviewer (called the auditor) is neither the person responsible for the performance under review nor is he the immediate supervisor of that person. [cf. Juran, 1974]

quality improvement teams: Any team that has been chartered by management to improve quality, usually through the improvement of an organization's processes. The Executive Steering Committee, Quality Management Boards and Process Action Teams are the teams associated with strategic process improvements.

quality improvement: Positive change in an indicator of quality based on process improvement.

quality management (vs. quality control). Systematic analysis and improvement of a causal system--rather than actions taken on the output.

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Quality Management Board (QMB): A QMB is a team composed of all the managers who are jointly responsible for a process, system, product, or service. QMBs represent the deployment structure for strategic goals and objectives and, as such, have cross-functional membership. The QMB develops the process improvement plan for a goal or objective, and is responsible for improvements associated with the plan. The QMB is typically chaired by a line manager, but chairmanship can rotate to other members for reasons of accountability or simply to share the responsibility for ownership.

run chart: A line graph that depicts data plotted over time. Run charts are used to identify patterns of performance and trends, to show changes in a process and to compare different groups.

scatter diagram: A graph depicting the strength and shape of the relationship between two variables. It is the simplest way to study correlation. Scatter diagrams are used to indicate how changes in one variable are related to changes in another variable.

scientific method: A systematic and consistent set of procedures designed to understand and predict behavior. The basic approach involves induction, deduction, and verification.

significant process: A process that is important to the mission of the organization.

socio-technical systems: Concept that a work group is neither a technical nor a social system, but an interdependent social system. [cf. Shafritz, 1980]

span of control: The spatial, temporal, or resource limits accorded to a member of management.

special causes (of variation): Causes that are not in the process all the time or do not affect everyone, but arise because of specific circumstances. Sources of variation that are unpredictable or unstable.

specification limits: Range of values, based on customer standards or engineering requirements, used to judge the acceptability of a product or service.

stable process: A process in which variation in outputs arises only from common causes. A process that is stable is predictable. [cf. Moen et al., 1991]

stakeholder analysis: A step in process improvement that identifies and prioritizes the stakeholders.

stakeholders: The groups and individuals inside or outside the organization who affect and are affected by the achievement of the organization's missions, goals, and strategies.

statistical control: The condition describing a process from which all special causes have been eliminated and only common causes remain; evidenced on a control chart by the absence of points beyond the control limits and by the absence of non-random patterns or trends within the control limits.

statistical process control (SPC): A scientific method of measuring, collecting, and analyzing data for the purpose of reducing process variation.

statistics: The use of mathematical tools (e.g., averages, spread, and shapes of distributions) to either (a) describe characteristics of a set of data or (b) to make inferences to the population from which the data were drawn.

special causes (of variation): Causes that are not in the process all the time or do not affect everyone, but arise because of specific circumstances. Sources of variation that are unpredictable or unstable. [cf. Moen et al., 1991]

strategic framework: The combination of an organization's mission, vision, and guiding principles which serves as a context for practicing strategic management.

strategic goal: A long-range performance target consistent with an organization's mission, usually requiring a substantial commitment of resources and **achievement of** mid-term and short term supported plans. Achievement of strategic goals moves an organization closer to realizing its vision.

strategic intent: An active management process focusing attention on future threats and opportunities as part of an enduring quest for global leadership. It is a driving force impelling management toward its vision.

strategic leadership: Actions focused on setting a long-term direction and vision for the future, communicating that vision to those who have the knowledge, commitment, and power to help achieve the vision, and inspiring them to keep moving in the right direction.

strategic management: A process that links strategic planning and strategic intent with day-to-day operational management into a single management process.

strategic plan: A document which describes the mission, vision, guiding principles, strategic goals, and strategies an organization intends to pursue over a ten to twenty year period. It serves as a clear and enduring statement of an organization's intention for its employees, its customers and its suppliers.

strategic planning: The process by which the guiding members of an organization envision its future and develop the necessary procedures and operations to achieve that future. [cf. Ackoff, 1981]

strategy: A plan or other means for achieving a long-range strategic goal.

suboptimization: A condition that occurs when the performance of a subsystem or process has a net negative effect on the aim of the total system.

supplier: The person or group that provides an input to the process. [cf. Moen et al., 1991] **External supplier:** An individual or group outside the boundaries of the receiving organization that provides materials, products, information or services to an individual or group inside the boundaries of the receiving organization. **Internal supplier:** An individual or group within the boundaries of an organization (department/division/office) that provides input to another individual or group within the organization.

supporting plans: Plans developed throughout the organization that contribute specifically to the achievement of the strategic plan.

system: A collection of parts that interact with each other to function as a whole. [cf. Kauffman, 1980] A series of functions or activities . . . within an organization that work together for the aim of the organization. [cf. Deming, 1989]

system optimization: See **optimization.**

tactics: The ways the strategies will be accomplished by specifying tasks that will be undertaken in the short term to support performance goals.

Taguchi loss function: A parabolic function describing an increasing economic loss the farther products are from target values, even though they may be within engineering specifications. This concept was demonstrated mathematically by Genichi Taguchi.

tampering: Action taken on the common cause system to compensate for the variation incorrectly believed to be due to common causes. This behavior will lead to greater variation, not less.

team: A group convened to improve processes, products, or services to serve the needs of the organization and its customers. Optimally, a team has five to nine members, often includes line workers along with supervisors and managers to get input from people who work on the process daily. [cf. Scholtes et al., 1988]

team leader: One who schedules team meetings, sets agenda and assigns action items, encourages communications, keeps records of team progress, collects data from team members, performs routine data analyses, reports results of data analyses.

theory of knowledge: The supposition that knowledge increases when information from the environment supports or fails to support a prediction derived from *a priori* knowledge or experimentation.

tiger team: Formation of a group of individuals knowledgeable in a particular problem or process. Similar to a task force designed to answer a particular question or solve a specific problem.

total quality: An extension of the quality concept to include improvement of all of the quality characteristics that influence customer-perceived quality. This includes sources of variation from incoming supplies, all of the significant processes within an organization, and all those that can influence customer satisfaction, needs or expectations when the product (or service) has left the organization. Systematic improvement of all of these sources of variation is referred to as total quality management.

total quality coordinator: A person selected by the TQ Leader to become specially trained and to assist with the transition from quality control to total quality management. Provides advice and assistance to the ESC in implementing TQL in the organizations. Coordinates all TQL implementation activities in the organization.

Total Quality Leadership (TQL): Total Quality Leadership is the application of quantitative methods and people, to assess and improve materials and services supplied to the organization; all significant processes within the organization; and meeting the needs of the end user, now and in the future. [cf. Garrett, 1990]

TQL: See **total quality leadership.**

transformation: A shift from one way of being to a new way of being. [cf. Scholtes et al., 1988]

transformational process: The operations required to change inputs into a product or service. This process consists of the steps necessary to change inputs into outputs.

"unknowable" costs: Costs that result from poor quality but cannot be readily quantified in financial terms. For example, the cost to an organization of a dissatisfied customer, or for employees who are afraid to make suggestions or take risks that might lead to better quality.

unstable process: A process in which variation is a result of both common and special causes. [cf. Moen et al., 1991] See also **stable process.**

upstream supplier: An individual or group that provides its input earlier in the process flow.

upward link: The team leader of a subordinate team.

value-added versus cost-added: Steps in a process that are essential for producing the required product or service are called value-added, while non-essential steps that are only being performed in order to deal with errors, omissions, defects, waste, storage, etc. are considered cost-added.

value-added: See **value-added versus cost-added**.

values: Enduring beliefs and assumptions about specific modes of conduct or states of existence that are preferable to opposite or converse modes of conduct or states of existence.

variables: Characteristics of persons or things (e.g., the time it takes to get to work) that can be continuous or discrete. (Glass and Stanley, 1970).

variation: The observed differences in output characteristics produced by a process. Some variation is inherent and irreducible.

vision: Idealized view of a desirable and potentially achievable future state. See also **vision statement.**

vision statement: A written document describing an idealized view of where or what an organization would like to be in the future.

zero defects: A situation that exists when all quality characteristics are produced within design specifications. This concept is reflected in the attitude that defects can be prevented, especially if more attention is given to the task at hand. The theme that most embodies this concept is "do it right the first time."

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APPENDIX B. PERSONAL LETTER TO SURVEYEES

Dear Sir:

My name is Roberto Carvajal, Commander of the Chilean Navy and student at the Naval Postgraduate School in Monterey, California. I am currently attending the curriculum 818 (Defense Systems Management for International Students) in the Systems Management Department. My date of graduation is scheduled for June 15, 1996 after 18 months at the school.

I am writing a thesis on quality management process in order to provide answers to the following research questions:

1.   Is it possible to successfully implement a TQL approach onboard a warship?
2.   What are the main positive outcomes after implementing the TQL philosophy onboard the USS Carl Vinson?
3.   What are the main obstacles in implementing TQL onboard the USS Carl Vinson?
4.   What are the main experiences from the TQL implementation process onboard the USS Carl Vinson for future applications in Chilean warships?

The methodology I am following to find the required information is to consider an in-depth case study of the USS Carl Vinson's TQL implementation process. This requires me to undertake some surveys, interviews, and questionnaires for top managers and crew members.

In this context I am requesting some of your valuable time by answering the enclosed questionnaire/survey. Your information will be of great value not only to my thesis, but also for the Chilean Navy.

Your answers will help me to figure out the actual benefit of implementing a quality management approach, like TQL, onboard a warship. For your information, the assessment will primarily be done by going through Deming's Fourteen Points, although no prior background about Deming's philosophy is required to fill out the survey.

Finally, please understand that it is very important for the research to get responses that best fit your actual thoughts in terms of your own experience on the topic. I ask you to think carefully on each question and provide me with your honest opinions. Please let be assured that your responses will be treated confidentially. No personal identification is included on the answer sheet of the survey.

Thank you!

Monterey, 18 January 1996.

APPENDIX C. CREW QUESTIONNAIRE

QUESTIONNAIRE FOR CARL VINSON's CREW MEMBERS

SECTION 1 - GENERAL DATA

The following five questions are designed to obtain some general information about the surveyees to be used for statistical purposes. Please answer in this sheet these five questions. It is acceptable to tick more than one box for these five questions.

1.   What is your rank?

    ____   Officer
    ____ . Chief Petty Officer
    ____   Petty Officer
    ____   Enlisted (E1 to E4)

2.   How long have you served in the Navy?

    ____   Less than two years
    ____   2-5 years
    ____   More than five years

3.   How long have you served onboard the USS Carl Vinson?

    ____   Less than one year
    ____   1-3 years
    ____   More than three years

4.   Have you ever served as a member of one or more of the following groups?

    ____   A Process Team Action (PAT).
    ____   A Quality Management Board (QMB).
    ____   An Executive or Department Steering Committee (ESC or DSC).
    ____   A TQL Coordinator Team.
    ____   None of the above.
    ____   Other.   Please specify the name of the group: _____

5.   What TQL formal courses have you taken?

    ____   Introduction to TQL
    ____   Fundamentals of TQL
    ____   Team Skills and Concepts
    ____   Methods for Managing Quality
    ____   TQL Orientation for Senior Leaders, Mid-managers, and Supervisors
    ____   Implementing TQL
    ____   Systems Approach to Process Improvement

_____ Other. Please specify the name of the course: _____

_____

SECTION 2 - GENERAL QUESTIONS ON QUALITY MANAGEMENT PROCESS

The following questions are designed to assess the current standard onboard the USS Carl Vinson as to how well the ship is performing in terms of quality management, from the viewpoint of crew members. Remember that your own answers are very important to provide meaningful findings. Now use the enclosed answer sheet to respond the following 82 questions.

POINT 1 -   Create and publish to all employees a statement of the aims and purpose of the company or other organization. The management must demonstrate constantly their commitment to this statement.

1.   I clearly understand how my daily work contributes to the goals of my department.

2.   I know the mission, vision and general guidelines of my department.

3.   I have a clear idea of what is my ship's mission.

4.   I have a clear idea of what I could do to support my department's mission.

5.   Leadership usually appreciates and values my effort in maintaining in good shape the equipment under my responsibility.

6.   I do not have too many problems acquiring the required training to get my job done even under changes in technologies and positions within my department.

POINT 2 -   Learn the new philosophy, top managment and everybody.

7.   Most sailors are committed to reducing rework and time delays in my department.

8.   Our approach is to prevent mistakes during the work execution period rather than after completing the task.

9.   In my department we are committed to better use the resources assigned to us to get the job done.

10.   Leadership continuously looks for improvement by analyzing the process rather than measuring specific outcomes.

11.   Formal inspections should not be eliminated because in my belief it is still the best way to ensure that everything is operating correctly.

POINT 3 - Understand the purpose of inspection, for improvement of processes and reduction of cost.

12. Sailors and supervisors have some authority to take action by introducing changes in the process in pursuing quality improvement.

13. I still believe that final inspections are really more effective than in-depth analysis of processes to improve quality in my department.

14. Leadership usually blames sailors for mistakes rather than examining the process to see what is going wrong beyond the reach of workers.

15. We have data readily available in the workplace but nobody is really interested in collecting it or does not know how to use it to improve quality.

POINT 4 - End the practice of awarding business on the basis of price tag alone.

16. Those who work on procurement tend to buy at the lowest cost regardless of the required quality.

17. I believe that buyers clearly understand what we need in terms of quality when requesting material to be purchased.

18. I believe that suppliers have enough information about what we need when they are required to fill an order placed by the ship.

19. I have the feeling that we work with so many suppliers that it is difficult to build long-term relationship based on trust with most of them.

POINT 5 - Improve constantly and forever the system of production and service.

20. I do not think I can get significant improvements in the way I perform my job. It is a waste of time to review the process or procedures that I am using.

21. The equipment under my responsibility do not require innovation at all; they perform as expected and I think it is difficult to upgrade them in a significant way.

22. I clearly see the necessity of innovation in most equipment but I do not have the required support from leadership to look for new technology.

23. Actually I believe that leadership is also aware of the necessity of improving performance of the equipment under my control by investing in new technology but they are reluctant to push the requirement up the chain of command.

24. I sense that leadership is starting to pay more attention to the long range results by judging their actions.

25. The procedures I use to do daily tasks do not require process improvements.

26. I have the right tools to do my job.

27.   My requests for replacement tools and supplies are handled promptly.

POINT 6 -   Institute training (for skills).

28.   I feel myself properly trained to get my job done.

29.   I am usually instructed not only in what to do but also in why it is necessary to do so.

30.   I understand the concept of customers and I know who my main customers are.

31.   I understand the concept of "supplier" and I know who my main suppliers are.

32.   Leadership is always concerned in ensuring that I am properly trained to perform my job.

33.   Leadership does not see training as a valuable investment but rather they see it as an expense.

34.   I usually receive the required training at the appropriate time for helping me to get my job done. That is not too late or too early.

35.   I am regularly moving to different jobs within my department in order to increase my training in performing different activities.

POINT 7 -   Teach and institute leadership.

36.   I perceive my supervisor as a coach rather than the traditional supervisor. He is a person who is effectively helping me in doing a better job.

37.   I have available most of the tools and my equipment is properly calibrated for getting the job done effectively.

38.   My supervisor usually shares his experience with me in order to facilitate my job.

39.   My supervisor usually directs me what to do but I often do not understand what he really means and/or what is the overall idea behind his instructions.

40.   I would say that my supervisor does not know specifically about my job and, moreover, he even does not understand the whole process related with my job.

POINT 8 -   Drive out fear. Create trust. Create a climate for innovation.

41.   I feel free to pass up the chain of command both the good as well the bad news. I have confidence that my superiors will react properly.

42.   My supervisors are continuously interested in collecting useful information and recommendations from sailors and they use them effectively to improve processes.

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43.   I would prefer that other sailors mention the problems or report the bad news to my supervisors. It is not an easy task and I believe I will not receive back anything good.

44.   I have many ideas to improve processes in my workplace but I prefer to keep them to myself instead of communicating them to my superiors.

45.   I feel I can tell almost any problem to my supervisor and I am sure that most of the time he will be willing to help me in finding sound solutions.

46.   People are rewarded for making process improvements in the workplace.

POINT 9 -   Optimize toward the aims and purposes of the company the efforts of teams, groups, staff areas, too.

47.   Leadership is usually encouraging the creation of teams whenever they judge them useful to improve processes.

48.   Most of the time the results from the team are positive in terms of effectively improving processes.

49.   It is relatively easy for me to get the required support from people working in other departments or divisions onboard the ship which in turn facilitates my job.

50.   I perceive as a waste of time every time I am assigned to a team chartered to improve processes.

51.   I believe that everybody is doing a good job but the problem here is that there is a lack of coordination to effectively tie together those efforts.

52.   Everybody wants to be a super star in the job but the problem is that most of them do not care about doing the right things for the benefit of the department or the ship as a whole.

53.   My experience tells me that every time I do my job thinking of the aims of my department or the ship I ended up worse off and others take advantage of my work.

POINT 10 -   Eliminate exhortations for the work force.

54.   I really hate most of the slogans spread throughout the ship (if so). They do not help me to perform a better job.

55.   Slogans currently spread throughout the ship (if so) seem to tell me that I am not already trying to do my best.

56.   Leadership repeatedly asks us to "take pride in our work."

POINT 11 -   (a) Eliminate numerical quotas for production. Instead, learn and institute methods for improvement.

(b) Eliminate M.B.O. (management by objective). Instead, learn the capabilities of processes, and how to improve them.

57.   I often feel frustrated because my supervisor is usually concerned in outcomes without being interested in the factors influencing those outcomes, especially when the outcomes are not good at all.

58.   My supervisor does not put too much attention in the problems affecting the quality of my work even though it is very clear that many of the problems are beyond my ability to be solved.

59.   Leadership only use data to ensure that we are accomplishing specific targets in performing our job. This approach is much easier for them than listening to various excuses for not meeting those targets.

60.   I often feel myself confronted with other shipmates because we are required to meet pre assigned targets or objectives that are in clear competition.

61.   My supervisor usually set targets or objectives affecting my job by considering the capabilities and limitations of the process.

62.   Leadership seems to believe that sailors need numerical goals to stay motivated.

POINT 12 - Remove barriers that rob people of pride of workmanship.

63.   I feel frustrated because I do not have the opportunity to increase my training in the new technology thus affecting my ability to get the job done.

64.   I believe that one of the main barriers to do a better job in my particular case is simply because I do not have the required time and other resources readily available.

65.   I feel I could perform a better job if my supervisors would be able to help me, but unfortunately that is not currently possible because they do not know my job or simply because of lack of communication.

66.   I know we have to be periodically evaluated by regulations but I strongly believe that the specific procedures utilized by my supervisors contribute even more to create additional barriers for me to perform a better job.

67.   I believe that the performance appraisal system onboard reduces barriers and fosters cooperation among shipmates in doing a better job.

68.   Leadership believes and acts as though sailors are the most important asset of the ship.

69.   People who get promoted in my division really deserve it.

70.   My Division Officer understands my job and process I conduct on a daily basis.

71.   My supervisor understands my job and process I conduct on a daily basis.

72.   People are adequately rewarded for the job conducted.

POINT 13 - Encourage education and self-improvement for everyone.

73. I have many opportunities provided by the ship to improve my educational level.

74. Leadership is continuously encouraging us to take advantage of the opportunities for improving our educational level.

75. My supervisors are willing to provide me with the required time to use some of the various alternatives provided by the ship to improve my education.

76. The various alternatives provided by the ship to improve the educational level of the crew are easy to use and are reachable for every sailor.

POINT 14 - Take action to accomplish the transformation.

77. I believe my chain of command is committed to quality improvement.

78. In my opinion the only people who are really interested on the new approach for quality are the leadership. It seems to me that they want to make the transformation by themselves, that is, without too much involvement of the crew members.

79. I clearly see how there is an increasing number of people onboard, especially those in the top positions, committed to the new approach to manage quality. I would say that sooner or later I will be also involved in that issue.

80. I completely identify myself with my ship's commitment to undergo a huge transformation related to the way we approach quality management.

81. I believe that the focus on quality is just one more program that will fade away like all the others.

82. I have witnessed the use of TQL to successfully improve an area (or a process) of the ship.

APPENDIX D. QUESTIONNAIRE FOR THE COMMANDING OFFICER

Note: Please write down your responses on a separate sheet. Give as much information as you feel necessary. The answers to each question should preferably be typewritten.

1.   Briefly describe your training, education, and experience in TQL. Please include the approximate dates you took the various courses.

2.   How has TQL improved the operational readiness of the ship?

3.   Describe the TQL implementation process onboard the ship and how it differs from the TQL office guidelines.

4.   Describe the main barriers against successfully implementing the TQL approach onboard the ship. If possible, provide some hints, from your own experience, to take into account to mitigate those barriers.

5.   How has TQL contributed to face formal inspections? If possible provide some statistics in terms of performance.

6.   Has TQL affected the regular chain of command onboard the ship? If so, how?

7.   Have you detected some differences in terms of the acceptance of TQL among the various departments? If so, how would you explain that situation?

8.   What kind of feedback do you receive to assess the advances of the TQL implementation plan?

9.   How has TQL affected the budget of the ship? What proportion of the budget do you allocate for TQL? Do you see some return on that investment?

10.   Do you have some prior TQL experience you want to share?

11.   What do you expect from TQL onboard your ship for the near future?

12.   How has TQL affected the morale and discipline of the crew members?

13.   How has TQL affected cooperation among departments to carry out shared tasks?

14.   Suppose you were requested to assist an allied Navy to implement a quality management approach onboard warships. What would be your key recommendations?

APPENDIX E. QUESTIONNAIRE FOR THE DEPARTMENT HEADS

Note: Please write down your responses for questions 4 to 9 on a separate sheet. Give as much information as you feel necessary. The answers for those questions should preferably be typewritten.

1.   What is your rank?   _____

2.   What is your current position onboard the USS Carl Vinson and how long have you held that position?

_____

3.   How long have you served in the Navy?   _____

4.   Briefly explain your training, education, and experience in TQL. Please include the approximate date you took on the various courses.

5.   How do you view the acceptance of TQL in your department? Please explain briefly.

6.   Identify and explain briefly one process in your department in which TQL has been useful in terms of quality improvement.

7.   What are the main barriers for successfully TQL implementation in your department? What would you recommend to overcome those barriers?

8.   Do you think that TQL in some way interferes with the regular chain of command? Please explain, based in your own experience.

9.   How has TQL affected the discipline and morale of your personnel? Please explain briefly.

APPENDIX F. QUESTIONNAIRE FOR THE COMMAND TQL COORDINATOR

Note: Please write down your responses for questions 4 to 12 on a separate sheet. Give as much information as you feel necessary. The answers for those questions should preferably be typewritten.

1. What is your rank? _____

2. What is your current position onboard the USS Carl Vinson and how long have you held that position?

   _____

3. How long have you served in the Navy? _____

4. How has the TQL training evolved since its implementation onboard? Please include an update statistic of TQL training level sorted by department and rank.

5. Do you feel comfortable in your position as TQL coordinator? Please briefly explain.

6. How well do you feel top management supports the TQL implementation process? Please include up to Department Heads.

7. Identify and explain the main obstacles for TQL implementation onboard.

8. Do you see any differences among departments onboard the ship in terms of their commitment to TQL? If so, how would you explain that situation?

9. Briefly explain your training, education, and experience in TQL. Please include the approximate date you took the various courses.

10. How would you define your specific role as the TQL coordinator? How do you relate with other key members onboard the ship?

11. Identify and explain the main positive outcomes credited to TQL onboard.

12. Please fully explain three processes improved onboard by using TQL. Please include the description of the processes, the approach used to improve them, the analytical tools used, and the outcomes obtained.

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APPENDIX G. QUESTIONNAIRE FOR THE SENIOR ENLISTED ADVISOR

Note: Please write down your responses for questions 4 to 9 on a separate sheet. Give as much information as you feel necessary. The answers for those questions should preferably be typewritten.

1.   What is your rank?   _____

2.   What is your current position onboard the USS Carl Vinson and how long have you held that position?

     _____

3.   How long have you served in the Navy?   _____

4.   Briefly explain your training, education, and experience in TQL. Please include the approximate date you took on the various courses.

5.   What is your specific role in the normal and in the TQL organization onboard?

6.   What has been your experience in regard to the TQL implementation process onboard the ship? Please briefly include the main positive and negative aspects from your personal point of view.

7.   How do you think TQL has affected the following issues onboard the ship?

     a.   Regular chain of command.
     b.   Morale and discipline of the crew members.
     c.   Cooperation among crew members from different departments.
     d.   Other.

8.   Identify and explain one process in which TQL has played an important role in improving quality.

9.   How would you assess the acceptance of the crew members about the TQL implementation process onboard the ship?

TQL Coordinator's Implementation Plan

Phase I: Reorganization

Jan 1995 through Jun 1996

Key Areas of Implementation	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18
M,V & GP's rewritten	■																	
Change TQL Coordinator add Production Coord.		X																
Creation of P,O,A & M		X																
End-user courses																		
TQL to Dept level		X																
Four Command Strategic Committees																		
Basic strategic planning		X																
Resource library established			X															
Annual TQL survey distributed				X														

Deployment

Deployment

TQL Coordinator's Implementation Plan

Phase II: Assess and Refocus Efforts

Jan 1995 through Jun 1996

Key Areas of Implementation	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18
Analyze survey results																		
Basic SPC/CPI trng																		
TQL office grand opening																		
Restructure TQL Team																		
Publish and train on Implementation Plan																		
Formalize DSC's																		
Dept pilot projects																		
New TQL Intro course																		
Establish connections with other org's																		
Select/train TQLC replacement																		

Deployment

TQL Coordinator's Implementation Plan

Phase III: Wrap-up First Cycle, Deployment   Apr 1996 through Sep 1997

Key Areas of Implementation	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18
Annual TQL survey																		
Assess effectiveness of first cycle																		
Set up for deployment education/trng/JITT				Deployment														
Training and support during operations																		
Plan for next cycle of implementation																		
Turnover of TQLC's																		
End-user courses																		
Begin Strategic Planning, Coronado Schoolhouse assist																		

APPENDIX I. USS CARL VINSON AND VARIOUS DEPARTMENT MISSIONS

USS CARL VINSON

MISSION

To project power anywhere in the world by conducting sustained combat air operations safely and efficiently while supporting embarked units.

VISION

- Obtain and maintain the best equipment available.

- Achieve the highest quality of life standards while safeguarding personnel, resources and the environment.

- Achieve the highest possible levels of readiness and training while providing superior educational and growth opportunities.

- Achieve maximum efficiency in rocedure, programs, and war fighting doctrine.

- Achieve maximum communications and control effectiveness.

GUIDING PRINCIPLES

- Honor, courage, and commitment.

- Personal integrity and responsibility.

- Leadership, supervision, and control.

- Effective chain of command.

- Preservation of assets.

- Environmental responsibility.

- Individual value and growth.

- Safety.

- Community and family involvement.

- Continuous improvement.

WEAPONS DEPARTMENT

MISSION

To provide the highest quality weapons safely and efficiently in support of airwing,
shipboard defense and battle group operations.

VISION

To be the premier shipboard weapons department in the Navy.

GUIDING PRINICPLES

We will achieve the highest standards of quality through:

Equal opportunity for all

Personnel accountability

Integrity and honesty

Personal growth

Leadership

Teamwork

Education and training

Providing a supportive atmosphere wherein all personnel can make a contribution.

Periodic review of our Mission, Vision and Guiding Principles and a willingness to redirect our efforts when
we find ourselves headed int he wrong direction.

AIRCRAFT INTERMEDIATE MAINTENANCE DEPARTMENT

MISSION

- To provide optimum maintenance, repair and logistics support to COMCRUDESGRU THREE Battle Force elements, Carrier Air Wing FOURTEEN and CVN 70 Departments through quality products and services.

VISION

- Our vision is to provide Carrier Air Wing FOURTEEN with the best AIMD support afloat. To set the highest standards of excellence in:

    - Communications up, down and across the chain of command.

    - Maintaining the highest standards of readiness and material condition.

    - Fostering innovation and personal readiness.

    - Providing our people with top quality of life and career advancement.

    - Achieving top safety record.

GUIDING PRINCIPLES

- Personal integrity, accountability, and responsibility.

- Personal dignity, worth and mission contributions of each Sailor.

- Superior leadership, supervision and planning.

- Strong chain of command.

- Preservation of equipment, tools and assets.

- Proactive environmental responsibility.

- Personal commitment to God, Constitution, US Navy and Family.

COMMUNICATIONS DEPARTMENT

MISSION

Ensure USS CARL VINSON Command Control Communications Computers and Intelligence (C4I) systems provide the highest quality communications service to support USS CARL VINSON and embarked staff's mission.

VISION

- Identify existing and anticipate future C4I requirements both internal and external to the department.

- Continually improve processes to realize optimization of the Command's combat mission.

- Acquire and constantly renew knowledge of the ship's processes.

- Efficiently and effectively operate and maintain communications systems.

- Realize, sustain and continuously refine C4I proficiency.

GUIDING PRINCIPLES

- Acknowledge, understand, and embrace the principles of leadership within the department. These principles include the leader's responsibility to plan, direct, set priorities, provide guidance and support,and pro-actively invite full participation of the assigned work force.

- Continuous improvement through education, training and personal commitment.

- Achieving our command mission is a collective rather than individual effort.

- Practice integrity, honesty, and personal commitment to ones self, the Navy and the chain of command.

- Pursue and practice resourc efficiency.

- Personnel at all levels have a responsibility to point out inefficiencies in our processes.

- Process improvement is a continuing requirement.

APPENDIX J. CARL VINSON CREW QUESTIONNAIRE - SUMMARY TABLE

	SENIORS (48)		JUNIORS (33)		FRESHMEN (56)		MORE EXP (39)		AVG EXP (44)		LESS EXP (54)		SUMMARY (137)		RANKING	
	AVG	STD DEV	AVG	STD DEV	AVG	STD DEV	AVG	STD DEV	AVG	STD DEV	AVG	STD DEV	AVG	STD DEV	AVG	STD DEV
POINT #1	1.92	0.91	2.27	1.09	2.09	1.02	1.92	1.02	2.07	0.98	2.28	1.01	2.07	1.01	1	1
POINT #2	2.62	1.27	2.70	1.24	2.59	1.26	2.67	1.32	2.59	1.22	2.63	1.25	2.62	1.26	6	13
POINT #3	2.93	1.24	3.19	1.40	3.13	1.30	3.12	1.35	2.95	1.25	3.14	1.32	3.07	1.31	12	14
POINT #4	3.06	1.30	3.23	1.20	3.03	1.16	3.22	1.33	3.02	1.18	3.04	1.17	3.09	1.22	13	12
POINT #5	2.69	1.14	2.97	1.23	2.66	1.23	2.76	1.20	2.73	1.15	2.96	1.23	2.83	1.20	9	11
POINT #6	2.47	1.13	2.63	1.20	2.48	1.13	2.44	1.17	2.57	1.14	2.51	1.12	2.51	1.14	5	5
POINT #7	2.45	1.15	2.54	1.08	2.44	1.20	2.56	1.15	2.48	1.10	2.39	1.20	2.47	1.15	3	6
POINT #8	2.34	1.04	2.65	1.23	2.56	1.22	2.57	1.24	2.37	1.05	2.57	1.20	2.50	1.17	4	8
POINT #9	2.87	1.14	3.06	1.17	2.89	1.17	2.95	1.22	2.99	1.14	2.85	1.14	2.92	1.16	10	7
POINT #10	3.34	1.07	3.35	1.17	3.45	1.12	3.38	1.17	3.39	1.03	3.40	1.14	3.39	1.11	14	2
POINT #11	3.01	1.13	2.96	1.03	3.12	1.18	3.02	1.16	3.02	1.06	3.09	1.16	3.05	1.13	11	4
POINT #12	2.79	1.15	2.99	1.22	2.73	1.19	2.88	1.25	2.88	1.12	2.72	1.19	2.82	1.19	8	10
POINT #13	2.22	1.09	2.50	1.16	2.18	1.11	2.32	1.17	2.25	1.04	2.26	1.14	2.27	1.12	2	3
POINT #14	2.77	1.13	2.92	1.17	2.67	1.18	2.78	1.22	2.85	1.15	2.69	1.14	2.77	1.17	7	9
SUMMARY AVG	2.68		2.85		2.72		2.76		2.73		2.75		2.74			
STD DEV	0.37		0.31		0.38		0.39		0.36		0.34		0.36			
RANKING AVG	1		6		2		5		3		4					
STD DEV	4		1		5		6		3		2					

NOTE: FOLLOWING PAGES SHOW A SUMMARY OF EVERY FOURTEEN POINT

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POINT #1 - CREATE CONSTANCY OF PURPOSE FOR IMPROVEMENT OF PRODUCTS AND SERVICES

QUESTION #1 - LEADERSHIP USUALLY APPRECIATES AND VALUES MY EFFORT IN MAINTAINING IN GOOD SHAPE THE EQUIPMENT UNDER MY RESPONSIBILITY

QUESTION #1	AVG	STD DEV
SENIORS (48)	2.00	0.77
JUNIORS (33)	2.18	0.98
FRESHMEN (56)	2.18	1.05
MORE EXP. (39)	1.90	0.99
AVG EXP. (44)	2.11	0.81
LESS EXP. (54)	2.28	0.98
SUMMARY (137)	2.12	0.94

QUESTION #9 - I CLEARLY UNDERSTAND HOW MY DAILY WORK CONTRIBUTES TO THE GOALS OF MY DEPARTMENT

QUESTION #9	AVG	STD DEV
SENIORS (48)	1.65	0.86
JUNIORS (33)	2.27	1.21
FRESHMEN (56)	1.93	0.89
MORE EXP. (39)	1.90	1.07
AVG EXP. (44)	1.89	0.99
LESS EXP. (54)	1.94	0.94
SUMMARY (137)	1.91	0.99

QUESTION #13 - I DO NOT HAVE TOO MANY PROBLEMS ACQUIRING THE REQUIRED TRAINING TO GET MY JOB DONE EVEN UNDER CHANGES IN TECHNOLOGIES AND POSITIONS WITHIN MY DEPARTMENT

QUESTION #13	AVG	STD DEV
SENIORS (48)	2.67	1.06
JUNIORS (33)	2.79	1.22
FRESHMEN (56)	2.36	1.10
MORE EXP. (39)	2.69	1.15
AVG EXP. (44)	2.66	1.16
LESS EXP. (54)	2.41	1.07
SUMMARY (137)	2.57	1.12

QUESTION #38 - I HAVE A CLEAR IDEA OF WHAT IS MY SHIP'S MISSION

QUESTION #38	AVG	STD DEV
SENIORS (48)	1.73	0.84
JUNIORS (33)	1.97	0.95
FRESHMEN (56)	1.70	1.04
MORE EXP. (39)	1.59	0.79
AVG EXP. (44)	1.75	0.89
LESS EXP. (54)	1.93	1.10
SUMMARY (137)	1.77	0.95

QUESTION #41 - I KNOW THE MISSION, VISION, AND GENERAL GUIDELINES OF MY DEPARTMENT

QUESTION #41	AVG	STD DEV
SENIORS (48)	1.77	0.83
JUNIORS (33)	2.15	1.03
FRESHMEN (56)	2.14	0.98
MORE EXP. (39)	1.72	0.97
AVG EXP. (44)	1.98	0.93
LESS EXP. (54)	2.26	0.91
SUMMARY (137)	2.01	0.95

QUESTION #59 - I HAVE A CLEAR IDEA OF WHAT I COULD DO TO SUPPORT MY DEPARTMENT'S MISSION

QUESTION #59	AVG	STD DEV
SENIORS (48)	1.71	0.65
JUNIORS (33)	2.27	1.01
FRESHMEN (56)	2.21	0.97
MORE EXP. (39)	1.72	0.76
AVG EXP. (44)	2.02	0.88
LESS EXP. (54)	2.31	0.97
SUMMARY (137)	2.05	0.91

POINT #1 - GENERAL SUMMARY

POINT #1 (SUMMARY)	AVG	STD DEV
SENIORS (48)	1.92	0.91
JUNIORS (33)	2.27	1.09
FRESHMEN (56)	2.09	1.02
MORE EXP. (39)	1.92	1.02
AVG EXP. (44)	2.07	0.98
LESS EXP. (54)	2.28	1.01
GENERAL (137)	2.07	1.01

POINT #2 - LEARN THE NEW PHILOSOPHY: BOTH TOP MANAGEMENT AND EVERYBODY

QUESTION #2 - MOST SAILORS ARE COMMITTED TO REDUCING REWORK AND TIME DELAYS IN MY DEPARTMENT

	AVG	STD DEV
QUESTION #2		
SENIORS (48)	2.29	0.97
JUNIORS (33)	2.61	1.12
FRESHMEN (56)	2.14	1.02
MORE EXP (39)	2.54	1.12
AVG EXP (44)	2.32	1.01
LESS EXP (54)	2.13	0.97
GENERAL (137)	2.31	1.03

QUESTION #3 - OUR APPROACH IS TO PREVENT MISTAKES DURING THE WORK EXECUTION PERIOD RATHER THAN AFTER COMPLETING THE TASK

	AVG	STD DEV
QUESTION #3		
SENIORS (48)	1.83	0.88
JUNIORS (33)	2.21	1.05
FRESHMEN (56)	2.20	0.59
MORE EXP (39)	2.10	1.17
AVG EXP (44)	2.16	0.64
LESS EXP (54)	1.94	0.88
GENERAL (137)	1.93	0.93

QUESTION #4 - LEADERSHIP CONTINUOUSLY LOOKS FOR IMPROVEMENT BY ANALYZING THE PROCESS RATHER THAN MEASURING SPECIFIC OUTCOMES

	AVG	STD DEV
QUESTION #4		
SENIORS (48)	3.00	1.37
JUNIORS (33)	3.09	1.28
FRESHMEN (56)	3.04	1.26
MORE EXP (39)	2.92	1.38
AVG EXP (44)	3.09	1.31
LESS EXP (54)	3.07	1.24
GENERAL (137)	3.04	1.30

QUESTION #5 - FORMAL INSPECTIONS SHOULD NOT BE ELIMINATED BECAUSE IN MY BELIEF IT IS STILL THE BEST WAY TO ENSURE THAT EVERYTHING IS OPERATING CORRECTLY

	AVG	STD DEV
QUESTION #5B		
SENIORS (48)	3.67	1.28
JUNIORS (33)	3.18	1.38
FRESHMEN (56)	3.77	1.14
MORE EXP (39)	3.41	1.48
AVG EXP (44)	3.52	1.23
LESS EXP (54)	3.78	1.11
GENERAL (137)	3.59	1.26

QUESTION #27 - IN MY DEPARTMENT WE ARE COMMITTED TO BETTER USE THE RESOURCES ASSIGNED TO US TO GET THE JOB DONE

	AVG	STD DEV
QUESTION #27		
SENIORS (48)	2.31	0.93
JUNIORS (33)	2.39	1.12
FRESHMEN (56)	2.14	0.90
MORE EXP (39)	2.36	1.06
AVG EXP (44)	2.25	0.87
LESS EXP (54)	2.20	0.98
GENERAL (137)	2.26	0.96

POINT #2 - GENERAL SUMMARY

	AVG	STD DEV
POINT #2 (SUMMARY)		
SENIORS (48)	2.62	1.27
JUNIORS (33)	2.70	1.24
FRESHMEN (56)	2.59	1.26
MORE EXP (39)	2.67	1.32
AVG EXP (44)	2.59	1.22
LESS EXP (54)	2.63	1.25
SUMMARY (137)	2.62	1.26

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POINT #3 - UNDERSTAND THE PURPOSE OF INSPECTIONS, FOR IMPROVEMENT OF PROCESSES AND REDUCTION OF COST

QUESTION #6 - SAILORS AND SUPERVISORS HAVE SOME AUTHORITY TO TAKE ACTION BY INTRODUCING CHANGES IN THE PROCESS IN PURSUING QUALITY IMPROVEMENT

QUESTION #6	AVG	STD DEV
SENIORS (48)	2.13	0.94
JUNIORS (33)	2.36	1.43
FRESHMEN (56)	1.98	1.05
MORE EXP (39)	2.15	1.14
AVG EXP (44)	2.09	1.01
LESS EXP (54)	2.13	1.21
GENERAL (137)	2.12	1.12

QUESTION #7 - LEADERSHIP USUALLY BLAMES SAILORS FOR MISTAKES RATHER THAN EXAMINING THE PROCESS TO SEE WHAT IS GOING WRONG BEYOND THE REACH OF WORKERS

QUESTION #7B	AVG	STD DEV
SENIORS (48)	3.63	1.10
JUNIORS (33)	4.24	0.94
FRESHMEN (56)	4.00	0.91
MORE EXP (39)	4.10	1.02
AVG EXP (44)	3.75	0.92
LESS EXP (54)	3.94	1.07
GENERAL (137)	3.93	1.01

QUESTION #8 - WE HAVE DATA READILY AVAILABLE IN THE WORKPLACE BUT NOBODY IS REALLY INTERESTED IN COLLECTING IT OR DOES NOT KNOW HOW TO USE IT TO IMPROVE QUALITY

QUESTION #8B	AVG	STD DEV
SENIORS (48)	3.27	1.12
JUNIORS (33)	3.36	1.27
FRESHMEN (56)	3.41	1.12
MORE EXP (39)	3.44	1.19
AVG EXP (44)	3.23	1.20
LESS EXP (54)	3.39	1.11
GENERAL (137)	3.35	1.15

QUESTION #46 - I STILL BELIEVE THAT FINAL INSPECTIONS ARE REALLY MORE EFFECTIVE THAN IN-DEPTH ANALYSIS OF PROCESSES TO IMPROVE QUALITY IN MY DEPARTMENT

QUESTION #46B	AVG	STD DEV
SENIORS (48)	2.71	1.24
JUNIORS (33)	2.79	1.22
FRESHMEN (56)	3.13	1.19
MORE EXP (39)	2.79	1.22
AVG EXP (44)	2.73	1.23
LESS EXP (54)	3.11	1.21
GENERAL (137)	2.90	1.22

POINT #3 - GENERAL SUMMARY

POINT #3 (SUMMARY)	AVG	STD DEV
SENIORS (48)	2.93	1.24
JUNIORS (33)	3.19	1.40
FRESHMEN (56)	3.13	1.30
MORE EXP (39)	3.12	1.35
AVG EXP (44)	2.95	1.25
LESS EXP (54)	3.14	1.32
SUMMARY (137)	3.07	1.31

POINT #4 - END THE PRACTICE OF AWARDING BUSINESS ON THE BASIS OF PRICE TAG ALONE

QUESTION #10 - THOSE WHO WORK ON PROCUREMENT TEND TO BUY AT THE LOWEST COST REGARDLESS OF THE REQUIRED QUALITY

	AVG	STD DEV
QUESTION #10B		
SENIORS (48)	3.35	1.36
JUNIORS (33)	3.42	1.23
FRESHMEN (56)	3.16	1.11
MORE EXP (39)	3.46	1.27
AVG EXP (44)	3.16	1.32
LESS EXP (54)	3.28	1.12
GENERAL (137)	3.29	1.23

QUESTION #11 - I BELIEVE THAT SUPPLIERS HAVE ENOUGH INFORMATION ABOUT WHAT WE NEED WHEN THEY ARE REQUIRED TO FILL AN ORDER PLACED BY THE SHIP

	AVG	STD DEV
QUESTION #11		
SENIORS (48)	2.58	1.22
JUNIORS (33)	2.82	1.21
FRESHMEN (56)	2.79	1.22
MORE EXP (39)	2.77	1.35
AVG EXP (44)	2.73	1.08
LESS EXP (54)	2.69	1.23
GENERAL (137)	2.72	1.21

QUESTION #12 - I HAVE THE FEELING THAT WE WORK WITH SO MANY SUPPLIERS THAT IT IS DIFFICULT TO BUILD LONG TERM RELATIONSHIP BASED ON TRUST WITH MOST OF THEM

	AVG	STD DEV
QUESTION #12B		
SENIORS (48)	3.60	1.23
JUNIORS (33)	3.70	1.07
FRESHMEN (56)	3.55	1.04
MORE EXP (39)	3.92	1.18
AVG EXP (44)	3.41	1.11
LESS EXP (54)	3.54	1.04
GENERAL (137)	3.61	1.11

QUESTION #44 - I BELIEVE THAT BUYERS CLEARLY UNDERSTAND WHAT WE NEED IN TERMS OF QUALITY WHEN REQUESTING MATERIAL TO BE PURCHASED

	AVG	STD DEV
QUESTION #44		
SENIORS (48)	2.69	1.11
JUNIORS (33)	2.97	1.13
FRESHMEN (56)	2.63	1.07
MORE EXP (39)	2.74	1.16
AVG EXP (44)	2.80	1.11
LESS EXP (54)	2.67	1.06
GENERAL (137)	2.73	1.10

POINT #4 - GENERAL SUMMARY

	AVG	STD DEV
POINT #4 (SUMMARY)		
SENIORS (48)	3.06	1.30
JUNIORS (33)	3.23	1.20
FRESHMEN (56)	3.03	1.16
MORE EXP (39)	3.22	1.33
AVG EXP (44)	3.02	1.18
LESS EXP (54)	3.04	1.17
SUMMARY (137)	3.09	1.22

POINT #5 - IMPROVE CONSTANTLY AND FOREVER THE SYSTEM OF PRODUCTION AND SERVICE

QUESTION #14 - I DO NOT THINK I CAN GET SIGNIFICANT IMPROVEMENTS IN THE WAY I PERFORM MY JOB. IT IS A WASTE OF TIME TO REVIEW THE PROCESS OR PROCEDURES THAT I AM USING

QUESTION #14B	AVG	STD DEV
SENIORS (48)	2.31	1.21
JUNIORS (33)	2.52	1.30
FRESHMEN (56)	2.66	1.37
MORE EXP (39)	2.33	1.30
AVG EXP (44)	2.32	1.27
LESS EXP (54)	2.78	1.28
GENERAL (137)	2.50	1.30

QUESTION #15 - I CLEARLY SEE THE NECESSITY OF INNOVATION IN MOST EQUIPMENT BUT I DO NOT HAVE THE REQUIRED SUPPORT FROM LEADERSHIP TO LOOK FOR NEW TECHNOLOGY

QUESTION #15B	AVG	STD DEV
SENIORS (48)	2.98	1.00
JUNIORS (33)	3.45	1.09
FRESHMEN (56)	3.23	1.19
MORE EXP (39)	3.18	1.12
AVG EXP (44)	2.98	0.93
LESS EXP (54)	3.39	1.22
GENERAL (137)	3.20	1.11

QUESTION #16 - ACTUALLY I BELIEVE THAT LEADERSHIP IS ALSO AWARE OF THE NECESSITY OF IMPROVING PERFORMANCE OF THE EQUIPMENT UNDER MY CONTROL BY INVESTING IN NEW TECHNOLOGY BUT THEY ARE RELUCTANT TO PUSH THE REQUIREMENT UP THE CHAIN OF COMMAND

QUESTION #16B	AVG	STD DEV
SENIORS (48)	2.98	1.12
JUNIORS (33)	3.52	1.12
FRESHMEN (56)	3.39	1.09
MORE EXP (39)	3.31	1.24
AVG EXP (44)	3.00	1.16
LESS EXP (54)	3.48	0.97
GENERAL (137)	3.28	1.12

QUESTION #17 - THE PROCEDURES I USE TO DO DAILY TASKS DO NOT REQUIRE PROCESS IMPROVEMENTS

QUESTION #17B	AVG	STD DEV
SENIORS (48)	2.33	1.06
JUNIORS (33)	2.91	1.35
FRESHMEN (56)	3.18	1.19
MORE EXP (39)	2.54	1.27
AVG EXP (44)	2.55	1.09
LESS EXP (54)	3.24	1.23
GENERAL (137)	2.82	1.24

QUESTION #18 - MY REQUESTS FOR REPLACEMENT TOOLS AND SUPPLIES ARE HANDLED PROMPTLY

QUESTION #18	AVG	STD DEV
SENIORS (48)	3.00	1.20
JUNIORS (33)	3.00	1.30
FRESHMEN (56)	2.71	1.25
MORE EXP (39)	2.95	1.21
AVG EXP (44)	3.02	1.27
LESS EXP (54)	2.72	1.25
GENERAL (137)	2.88	1.24

QUESTION #24 - THE EQUIPMENT UNDER MY RESPONSIBILITY DO NOT REQUIRE INNOVATION AT ALL, THEY PERFORM AS EXPECTED AND I THINK IT IS DIFFICULT TO UPGRADE THEM IN A SIGNIFICANT WAY

QUESTION #24B	AVG	STD DEV
SENIORS (48)	2.50	1.07
JUNIORS (33)	2.94	1.12
FRESHMEN (56)	2.98	1.27
MORE EXP (39)	2.67	1.11
AVG EXP (44)	2.64	1.12
LESS EXP (54)	3.04	1.26
GENERAL (137)	2.80	1.18

QUESTION #30 - I HAVE THE RIGHT TOOLS TO DO MY JOB

QUESTION #30	AVG	STD DEV
SENIORS (48)	2.52	1.11
JUNIORS (33)	2.73	1.07
FRESHMEN (56)	2.55	1.13
MORE EXP (39)	2.59	0.94
AVG EXP (44)	2.70	1.17
LESS EXP (54)	2.48	1.16
GENERAL (137)	2.58	1.10

QUESTION #54 - I SENSE THAT LEADERSHIP IS STARTING TO PAY MORE ATTENTION TO THE LONG RANGE RESULTS BY JUDGING THEIR ACTIONS

QUESTION #54	AVG	STD DEV
SENIORS (48)	2.90	1.12
JUNIORS (33)	2.67	1.16
FRESHMEN (56)	2.29	0.95
MORE EXP (39)	2.54	1.14
AVG EXP (44)	2.66	1.01
LESS EXP (54)	2.57	1.13
GENERAL (137)	2.59	1.09

POINT #5 - GENERAL SUMMARY

	AVG	STD DEV
POINT #5 (SUMMARY)		
SENIORS (48)	2.69	1.14
JUNIORS (33)	2.97	1.23
FRESHMEN (56)	2.66	1.23
MORE EXP (39)	2.76	1.20
AVG EXP (44)	2.73	1.15
LESS EXP (54)	2.96	1.23
SUMMARY (137)	2.83	1.20

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POINT #6 - INSTITUTE TRAINING (FOR SKILLS)

QUESTION #19 - I AM USUALLY INSTRUCTED NOT ONLY IN WHAT TO DO BUT ALSO IN WHY IT IS NECESSARY TO DO SO

QUESTION #19	AVG	STD DEV
SENIORS (48)	2.63	1.08
JUNIORS (33)	2.85	1.28
FRESHMEN (56)	2.57	1.17
MORE EXP (39)	2.64	1.16
AVG EXP (44)	2.89	1.20
LESS EXP (54)	2.48	1.13
GENERAL (137)	2.66	1.17

QUESTION #20 - I UNDERSTAND THE CONCEPT OF "SUPPLIER AND I KNOW WHO MY MAIN SUPPLIERS ARE

QUESTION #20	AVG	STD DEV
SENIORS (48)	2.48	1.07
JUNIORS (33)	2.85	1.15
FRESHMEN (56)	2.55	1.11
MORE EXP (39)	2.41	1.04
AVG EXP (44)	2.73	1.09
LESS EXP (54)	2.63	1.17
GENERAL (137)	2.60	1.11

QUESTION #21 - LEADERSHIP DOES NOT SEE TRAINING AS A VALUABLE INVESTMENT BUT RATHER THEY SEE IT AS AN EXPENSE

QUESTION #21B	AVG	STD DEV
SENIORS (48)	2.65	1.30
JUNIORS (33)	3.12	1.39
FRESHMEN (56)	2.79	1.30
MORE EXP (39)	3.10	1.35
AVG EXP (44)	2.55	1.28
LESS EXP (54)	2.83	1.31
GENERAL (137)	2.82	1.32

QUESTION #22 - I FEEL MYSELF PROPERLY TRAINED TO GET MY JOB DONE

QUESTION #22	AVG	STD DEV
SENIORS (48)	2.00	1.11
JUNIORS (33)	2.24	0.97
FRESHMEN (56)	2.14	0.96
MORE EXP (39)	1.97	0.99
AVG EXP (44)	2.23	1.16
LESS EXP (54)	2.13	0.91
GENERAL (137)	2.12	1.02

QUESTION #23 - I USUALLY RECEIVE THE REQUIRED TRAINING AT THE APPROPRIATE TIME FOR HELPING ME TO GET MY JOB DONE. THAT IS NOT TOO LATE OR TOO EARLY

QUESTION #23	AVG	STD DEV
SENIORS (48)	2.63	1.06
JUNIORS (33)	2.36	1.06
FRESHMEN (56)	2.54	0.93
MORE EXP (39)	2.41	1.07
AVG EXP (44)	2.73	1.04
LESS EXP (54)	2.44	0.92
GENERAL (137)	2.53	1.01

QUESTION #33 - I UNDERSTAND THE CONCEPT OF CUSTOMERS AND I KNOW WHO MY MAIN CUSTOMERS ARE

QUESTION #33	AVG	STD DEV
SENIORS (48)	1.83	0.95
JUNIORS (33)	1.85	0.91
FRESHMEN (56)	2.23	1.04
MORE EXP (39)	1.72	0.97
AVG EXP (44)	1.98	0.88
LESS EXP (54)	2.22	1.06
GENERAL (137)	2.00	0.99

QUESTION #57 - I AM REGULARLY MOVING TO
DIFFERENT JOBS WITHIN MY DEPARTMENT IN ORDER
TO INCREASE MY TRAINING IN PERFORMING
DIFFERENT ACTIVITIES

QUESTION #57	AVG	STD DEV
SENIORS (48)	3.02	1.12
JUNIORS (33)	3.03	1.29
FRESHMEN (56)	2.73	1.30
MORE EXP (39)	2.77	1.31
AVG EXP (44)	3.05	1.16
LESS EXP (54)	2.89	1.25
GENERAL (137)	2.91	1.24

QUESTION #78 - LEADERSHIP IS ALWAYS
CONCERNED IN ENSURING THAT I AM PROPERLY
TRAINED TO PERFORM MY JOB

QUESTION #78	AVG	STD DEV
SENIORS (48)	2.50	0.88
JUNIORS (33)	2.73	0.98
FRESHMEN (56)	2.29	1.00
MORE EXP (39)	2.51	0.94
AVG EXP (44)	2.45	0.98
LESS EXP (54)	2.44	0.98
GENERAL (137)	2.47	0.96

POINT #6 - GENERAL SUMMARY

POINT #6 (SUMMARY)	AVG	STD DEV
SENIORS (48)	2.47	1.13
JUNIORS (33)	2.63	1.20
FRESHMEN (56)	2.48	1.13
MORE EXP (39)	2.44	1.17
AVG EXP (44)	2.57	1.14
LESS EXP (54)	2.51	1.12
SUMMARY (137)	2.51	1.14

POINT #7 - TEACH AND INSTITUTE LEADERSHIP

QUESTION #25 - I PERCEIVE MY SUPERVISOR AS A COACH RATHER THAN THE TRADITIONAL SUPERVISOR. HE IS A PERSON WHO IS EFFECTIVELY HELPING ME IN DOING A BETTER JOB

	AVG	STD DEV
QUESTION #25		
SENIORS (48)	2.67	1.29
JUNIORS (33)	2.33	1.19
FRESHMEN (56)	2.18	1.06
MORE EXP (39)	2.64	1.31
AVG EXP (44)	2.61	1.22
LESS EXP (54)	2.02	0.98
GENERAL (137)	2.39	1.19

QUESTION #26 - MY SUPERVISOR USUALLY SHARES HIS EXPERIENCE WITH ME IN ORDER TO FACILITATE MY JOB

	AVG	STD DEV
QUESTION #26		
SENIORS (48)	2.46	1.09
JUNIORS (33)	2.21	0.86
FRESHMEN (56)	2.16	1.11
MORE EXP (39)	2.44	1.02
AVG EXP (44)	2.41	0.97
LESS EXP (54)	2.06	1.11
GENERAL (137)	2.28	1.05

QUESTION #28 - MY SUPERVISOR USUALLY DIRECTS ME WHAT TO DO BUT I OFTEN DO NOT UNDERSTAND WHAT HE REALLY MEANS AND/OR WHAT IS THE OVERALL IDEA BEHIND HIS INSTRUCTIONS

	AVG	STD DEV
QUESTION #28B		
SENIORS (48)	2.46	1.03
JUNIORS (33)	3.00	1.06
FRESHMEN (56)	2.95	1.31
MORE EXP (39)	2.79	1.17
AVG EXP (44)	2.64	1.01
LESS EXP (54)	2.91	1.31
GENERAL (137)	2.79	1.18

QUESTION #29 - I WOULD SAY THAT MY SUPERVISOR DOES NOT KNOW SPECIFICALLY ABOUT MY JOB AND, MOREOVER, HE EVEN DOES NOT UNDERSTAND THE WHOLE PROCESS RELATED WITH MY JOB

	AVG	STD DEV
QUESTION #29B		
SENIORS (48)	2.50	1.40
JUNIORS (33)	2.79	1.19
FRESHMEN (56)	2.61	1.26
MORE EXP (39)	2.74	1.27
AVG EXP (44)	2.52	1.28
LESS EXP (54)	2.59	1.32
GENERAL (137)	2.61	1.29

QUESTION #50 - I HAVE AVAILABLE MOST OF THE TOOLS AND MY EQUIPMENT IS PROPERLY CALIBRATED FOR GETTING THE JOB DONE EFFECTIVELY

	AVG	STD DEV
QUESTION #50		
SENIORS (48)	2.17	0.83
JUNIORS (33)	2.36	0.90
FRESHMEN (56)	2.29	1.11
MORE EXP (39)	2.21	0.86
AVG EXP (44)	2.20	0.98
LESS EXP (54)	2.35	1.03
GENERAL (137)	2.26	0.96

POINT #7 - GENERAL SUMMARY

	AVG	STD DEV
POINT #7 (SUMMARY)		
SENIORS (48)	2.45	1.15
JUNIORS (33)	2.54	1.08
FRESHMEN (56)	2.44	1.20
MORE EXP (39)	2.56	1.15
AVG EXP (44)	2.48	1.10
LESS EXP (54)	2.39	1.20
SUMMARY (137)	2.47	1.15

POINT #8 - DRIVE OUT FEAR, CREATE TRUST AND A CLIMATE FOR INNOVATION

QUESTION #31 - I FEEL FREE TO PASS UP THE CHAIN OF COMMAND BOTH THE GOOD AS WELL AS THE BAD NEWS. I HAVE CONFIDENCE THAT MY SUPERIORS WILL REACT PROPERLY

QUESTION #31	AVG	STD DEV
SENIORS (48)	2.21	1.09
JUNIORS (33)	2.70	1.26
FRESHMEN (56)	2.46	1.31
MORE EXP (39)	2.54	1.29
AVG EXP (44)	2.18	1.02
LESS EXP (54)	2.56	1.33
GENERAL (137)	2.43	1.23

QUESTION #32 - MY SUPERVISORS ARE CONTINUOUSLY INTERESTED IN COLLECTING USEFUL INFORMATION AND RECOMMENDATIONS FROM SAILORS AND THEY USE THEM EFFECTIVELY TO IMPROVE PROCESSES

QUESTION #32	AVG	STD DEV
SENIORS (48)	2.67	1.00
JUNIORS (33)	2.70	1.19
FRESHMEN (56)	2.38	1.17
MORE EXP (39)	2.79	1.17
AVG EXP (44)	2.41	0.97
LESS EXP (54)	2.50	1.18
GENERAL (137)	2.55	1.12

QUESTION #34 - I WOULD PREFER THAT OTHER SAILORS MENTION THE PROBLEMS OR REPORT THE BAD NEWS TO MY SUPERVISORS. IT IS NOT AN EASY TASK AND I BELIEVE I WILL NOT RECEIVE BACK ANYTHING GOOD

QUESTION #34B	AVG	STD DEV
SENIORS (48)	2.48	1.15
JUNIORS (33)	2.33	1.16
FRESHMEN (56)	2.86	1.31
MORE EXP (39)	2.62	1.29
AVG EXP (44)	2.25	1.12
LESS EXP (54)	2.87	1.23
GENERAL (137)	2.60	1.23

QUESTION #35 - I HAVE MANY IDEAS TO IMPROVE PROCESSES IN MY WORKPLACE BUT I PREFER TO KEEP THEM TO MYSELF INSTEAD OF COMMUNICATING THEM TO MY SUPERIORS

QUESTION #35B	AVG	STD DEV
SENIORS (48)	2.04	0.62
JUNIORS (33)	2.58	0.45
FRESHMEN (56)	2.75	0.29
MORE EXP (39)	2.33	0.59
AVG EXP (44)	2.45	0.35
LESS EXP (54)	2.56	0.00
GENERAL (137)	2.46	0.49

QUESTION #36 - PEOPLE ARE REWARDED FOR MAKING PROCESS IMPROVEMENTS IN THE WORKPLACE

QUESTION #36	AVG	STD DEV
SENIORS (48)	2.54	1.03
JUNIORS (33)	2.94	1.17
FRESHMEN (56)	2.79	1.14
MORE EXP (39)	2.74	1.27
AVG EXP (44)	2.86	0.98
LESS EXP (54)	2.63	1.10
GENERAL (137)	2.74	1.11

QUESTION #52 - I FEEL I CAN TELL ALMOST ANY PROBLEM TO MY SUPERVISOR AND I AM SURE MOST OF THE TIME HE WILL BE WILLING TO HELP ME IN FINDING SOUND SOLUTIONS

QUESTION #52	AVG	STD DEV
SENIORS (48)	2.13	0.39
JUNIORS (33)	2.64	0.11
FRESHMEN (56)	2.13	0.17
MORE EXP (39)	2.38	0.66
AVG EXP (44)	2.05	0.58
LESS EXP (54)	2.31	0.40
GENERAL (137)	2.25	0.63

POINT #8 - GENERAL SUMMARY

POINT #8 (SUMMARY)	AVG	STD DEV
SENIORS (48)	2.34	1.04
JUNIORS (33)	2.65	1.23
FRESHMEN (56)	2.56	1.22
MORE EXP (39)	2.57	1.24
AVG EXP (44)	2.37	1.05
LESS EXP (54)	2.57	1.20
SUMMARY (137)	2.50	1.17

POINT #9 - OPTIMIZE TOWARD THE AIMS AND PURPOSES OF THE ORGANIZATION THE EFFORTS OF TEAMS, GROUPS, STAFF AREAS, TOO

QUESTION #37 - LEADERSHIP IS USUALLY ENCOURAGING THE CREATION OF TEAMS WHENEVER THEY JUDGE THEM USEFUL TO IMPROVE PROCESSES

	AVG	STD DEV
QUESTION #37		
SENIORS (48)	2.54	1.11
JUNIORS (33)	2.58	1.12
FRESHMEN (56)	2.41	1.02
MORE EXP (39)	2.54	1.17
AVG EXP (44)	2.57	1.09
LESS EXP (54)	2.41	1.00
GENERAL (137)	2.50	1.07

QUESTION #39 - MOST OF THE TIME THE RESULTS FROM THE TEAM ARE POSITIVE IN TERMS OF EFFECTIVELY IMPROVING PROCESSES

	AVG	STD DEV
QUESTION #39		
SENIORS (48)	2.33	0.97
JUNIORS (33)	2.42	0.90
FRESHMEN (56)	2.43	1.02
MORE EXP (39)	2.31	0.95
AVG EXP (44)	2.43	1.00
LESS EXP (54)	2.43	0.98
GENERAL (137)	2.72	0.97

QUESTION #40 - I PERCEIVE AS A WASTE OF TIME EVERY TIME I AM ASSIGNED TO A TEAM CHARTERED TO IMPROVE PROCESSES

	AVG	STD DEV
QUESTION #40B		
SENIORS (48)	2.88	1.08
JUNIORS (33)	2.94	1.09
FRESHMEN (56)	2.86	0.98
MORE EXP (39)	2.67	1.13
AVG EXP (44)	3.00	1.06
LESS EXP (54)	2.94	0.94
GENERAL (137)	2.88	1.04

QUESTION #42 - I BELIEVE THAT EVERYBODY IS DOING A GOOD JOB BUT THE PROBLEM HERE IS THAT THERE IS A LACK OF COORDINATION TO EFFECTIVELY TIE TOGETHER THOSE EFFORTS

	AVG	STD DEV
QUESTION #42B		
SENIORS (48)	3.50	0.60
JUNIORS (33)	3.52	0.68
FRESHMEN (56)	3.29	0.59
MORE EXP (39)	3.69	0.66
AVG EXP (44)	3.45	0.64
LESS EXP (54)	3.19	0.57
GENERAL (137)	3.42	0.62

QUESTION #43 - MY EXPERIENCE TELLS ME THAT EVERY TIME I DO MY JOB THINKING OF THE AIMS OF MY DEPARTMENT OR THE SHIP I ENDED UP WORSE OFF AND OTHERS TAKE ADVANTAGE OF MY WORK

	AVG	STD DEV
QUESTION #43B		
SENIORS (48)	2.56	1.11
JUNIORS (33)	3.58	1.06
FRESHMEN (56)	3.18	1.27
MORE EXP (39)	2.95	1.34
AVG EXP (44)	3.05	1.10
LESS EXP (54)	3.15	1.25
GENERAL (137)	3.06	1.22

QUESTION #63 - EVERYBODY WANTS TO BE A SUPER STAR IN THE JOB BUT THE PROBLEM IS THAT MOST OF THEM DO NOT CARE ABOUT DOING THE RIGHT THINGS FOR THE BENEFIT OF THE DEPARTMENT OR THE SHIP AS A WHOLE

	AVG	STD DEV
QUESTION #63B		
SENIORS (48)	3.29	1.17
JUNIORS (33)	3.55	1.06
FRESHMEN (56)	3.45	1.13
MORE EXP (39)	3.59	1.09
AVG EXP (44)	3.52	1.13
LESS EXP (54)	3.20	1.12
GENERAL (137)	3.42	1.12

QUESTION #80 - IT IS RELATIVELY EASY FOR ME TO GET THE REQUIRED SUPPORT FROM PEOPLE WORKING IN OTHER DEPARTMENTS OR DIVISIONS ONBOARD THE SHIP WHICH IN TURN FACILITATES MY JOB

	AVG	STD DEV
QUESTION #80		
SENIORS (48)	2.98	1.06
JUNIORS (33)	2.85	1.15
FRESHMEN (56)	2.61	1.12
MORE EXP (39)	2.87	1.15
AVG EXP (44)	2.89	1.02
LESS EXP (54)	2.67	1.17
GENERAL (137)	2.80	1.11

POINT #9 - GENERAL SUMMARY

	AVG	STD DEV
POINT #9 (SUMMARY)		
SENIORS (48)	2.87	1.14
JUNIORS (33)	3.06	1.17
FRESHMEN (56)	2.89	1.17
MORE EXP (39)	2.95	1.22
AVG EXP (44)	2.99	1.14
LESS EXP (54)	2.85	1.14
SUMMARY (137)	2.92	1.16

POINT #10 - ELIMINATE EXHORTATIONS FOR THE WORK FORCE

QUESTION #45 - I REALLY HATE MOST OF THE SLOGANS SPREAD THROUGHOUT
THE SHIP (IF SO). THEY DO NOT HELP ME TO PERFORM A BETTER JOB

	AVG	STD DEV
QUESTION #45B		
SENIORS (48)	3.33	1.08
JUNIORS (33)	3.27	1.26
FRESHMEN (56)	3.36	1.03
MORE EXP (39)	3.23	1.18
AVG EXP (44)	3.34	1.03
LESS EXP (54)	3.39	1.11
GENERAL (137)	3.33	1.10

QUESTION #47 - SLOGANS CURRENTLY SPREAD THROUGHOUT THE SHIP (IF SO)
SEEM TO TELL ME THAT I AM NOT ALREADY TRYING TO DO MY BEST

	AVG	STD DEV
QUESTION #47B		
SENIORS (48)	3.06	0.91
JUNIORS (33)	3.15	1.15
FRESHMEN (56)	3.29	1.00
MORE EXP (39)	3.13	1.00
AVG EXP (44)	3.14	0.93
LESS EXP (54)	3.24	1.08
GENERAL (137)	3.18	1.01

QUESTION #49 - LEADERSHIP REPEATEDLY ASKS TO "TAKE PRIDE IN OUR WORK"

	AVG	STD DEV
QUESTION #49B		
SENIORS (48)	3.63	1.16
JUNIORS (33)	3.64	1.08
FRESHMEN (56)	3.71	1.28
MORE EXP (39)	3.77	1.25
AVG EXP (44)	3.70	1.07
LESS EXP (54)	3.56	1.24
GENERAL (137)	3.66	1.18

POINT #10 - GENERAL SUMMARY

	AVG	STD DEV
POINT #10 (SUMMARY)		
SENIORS (48)	3.34	1.07
JUNIORS (33)	3.35	1.17
FRESHMEN (56)	3.45	1.12
MORE EXP (39)	3.38	1.17
AVG EXP (44)	3.39	1.03
LESS EXP (54)	3.40	1.14
SUMMARY (137)	3.39	1.11

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QUESTION #51 - I OFTEN FEEL FRUSTRATED BECAUSE MY SUPERVISOR IS USUALLY CONCERNED IN OUTCOMES WITHOUT BEING INTERESTED IN THE FACTORS INFLUENCING THOSE OUTCOMES, ESPECIALLY WHEN THE OUTCOMES ARE NOT GOOD AT ALL

QUESTION #51B	AVG	STD DEV
SENIORS (48)	3.13	1.18
JUNIORS (33)	2.94	1.27
FRESHMEN (56)	3.38	1.32
MORE EXP (39)	3.03	1.25
AVG EXP (44)	3.14	1.21
LESS EXP (54)	3.33	1.32
GENERAL (137)	3.18	1.26

QUESTION #53 - MY SUPERVISOR DOES NOT PUT TOO MUCH ATTENTION IN THE PROBLEMS AFFECTING THE QUALITY OF MY WORK THOUGH IT IS VERY CLEAR THAT MANY OF THE PROBLEMS ARE BEYOND MY ABILITY TO BE SOLVED

QUESTION #53B	AVG	STD DEV
SENIORS (48)	2.81	1.04
JUNIORS (33)	3.00	0.97
FRESHMEN (56)	2.95	1.18
MORE EXP (39)	2.90	1.07
AVG EXP (44)	2.95	1.01
LESS EXP (54)	2.89	1.16
GENERAL (137)	2.91	1.08

QUESTION #55 - LEADERSHIP ONLY USE DATA TO ENSURE THAT WE ARE ACCOMPLISHING SPECIFIC TARGETS IN PERFORMING OUR JOB. THIS APPROACH IS MUCH EASIER FOR THEM THAN LISTENING TO VARIOUS EXCUSES FOR NOT MEETING THOSE TARGETS

QUESTION #55B	AVG	STD DEV
SENIORS (48)	3.15	1.05
JUNIORS (33)	3.18	0.98
FRESHMEN (56)	3.32	1.03
MORE EXP (39)	3.10	1.07
AVG EXP (44)	3.30	1.02
LESS EXP (54)	3.26	0.99
GENERAL (137)	3.23	1.02

QUESTION #56 - MY SUPERVISOR USUALLY SET TARGETS OR OBJECTIVES AFFECTING MY JOB BY CONSIDERING THE CAPABILITIES AND LIMITATIONS OF THE PROCESS

QUESTION #56	AVG	STD DEV
SENIORS (48)	2.42	1.07
JUNIORS (33)	2.82	0.81
FRESHMEN (56)	2.43	0.99
MORE EXP (39)	2.46	1.12
AVG EXP (44)	2.64	0.87
LESS EXP (54)	2.46	0.99
GENERAL (137)	2.52	0.99

QUESTION #58 - LEADERSHIP SEEMS TO BELIEVE THAT SAILORS NEED NUMERICAL GOALS TO STAY MOTIVATED

QUESTION #58B	AVG	STD DEV
SENIORS (48)	3.52	1.05
JUNIORS (33)	3.06	0.93
FRESHMEN (56)	3.41	1.09
MORE EXP (39)	3.62	1.07
AVG EXP (44)	3.14	0.95
LESS EXP (54)	3.37	1.09
GENERAL (137)	3.36	1.05

QUESTION #65 - I OFTEN FEEL MYSELF CONFRONTED WITH OTHER SHIPMATES BECAUSE WE ARE REQUIRED TO MEET PRE ASSIGNED TARGETS OR OBJECTIVES THAT ARE IN CLEAR COMPETITION

QUESTION #65B	AVG	STD DEV
SENIORS (48)	3.04	1.11
JUNIORS (33)	2.79	1.19
FRESHMEN (56)	3.25	1.16
MORE EXP (39)	3.03	1.11
AVG EXP (44)	2.93	1.21
LESS EXP (54)	3.20	1.16
GENERAL (137)	3.07	1.16

POINT #11 - GENERAL SUMMARY

POINT #11 (SUMMARY)	AVG	STD DEV
SENIORS (48)	3.01	1.13
JUNIORS (33)	2.96	1.03
FRESHMEN (56)	3.12	1.18
MORE EXP (39)	3.02	1.16
AVG EXP (44)	3.02	1.06
LESS EXP (54)	3.09	1.16
SUMMARY (137)	3.05	1.13

POINT #12 - REMOVE BARRIERS THAT ROB PEOPLE OF PRIDE OF WORKMANSHIP

QUESTION #60 - I FEEL FRUSTRATED BECAUSE I DO NOT HAVE THE OPPORTUNITY TO INCREASE MY TRAINING IN THE NEW TECHNOLOGY THUS AFFECTING MY ABILITY TO GET THE JOB DONE

QUESTION #60B	AVG	STD DEV
SENIORS (48)	2.96	1.09
JUNIORS (33)	3.21	1.11
FRESHMEN (56)	2.79	1.06
MORE EXP (39)	3.00	1.05
AVG EXP (44)	3.20	1.12
LESS EXP (54)	2.70	1.04
GENERAL (137)	2.95	1.09

QUESTION #62 - I BELIEVE THAT ONE OF THE MAIN BARRIERS TO DO A BETTER JOB IN MY PARTICULAR CASE IS SIMPLY BECAUSE I DO NOT HAVE THE REQUIRED TIME AND OTHER RESOURCES READILY AVAILABLE

QUESTION #62B	AVG	STD DEV
SENIORS (48)	3.10	1.13
JUNIORS (33)	3.30	1.16
FRESHMEN (56)	2.91	1.12
MORE EXP (39)	3.10	1.25
AVG EXP (44)	3.13	1.10
LESS EXP (54)	3.04	1.12
GENERAL (137)	3.07	1.14

QUESTION #64 - I FEEL I COULD PERFORM A BETTER JOB IF MY SUPERVISORS WOULD BE ABLE TO HELP ME, BUT UNFORTUNATELY THAT IS NOT CURRENTLY POSSIBLE BECAUSE THEY DO NOT KNOW MY JOB OR SIMPLY BECAUSE OF LACK OF COMMUNICATION

QUESTION #64B	AVG	STD DEV
SENIORS (48)	2.50	0.97
JUNIORS (33)	3.12	1.27
FRESHMEN (56)	2.84	1.30
MORE EXP (39)	2.77	1.29
AVG EXP (44)	2.77	1.16
LESS EXP (54)	2.81	1.20
GENERAL (137)	2.79	1.20

QUESTION #66 - LEADERSHIP BELIEVES AND ACTS AS THOUGH SAILORS ARE THE MOST IMPORTANT ASSET OF THE SHIP

QUESTION #66	AVG	STD DEV
SENIORS (48)	3.25	1.25
JUNIORS (33)	3.27	1.26
FRESHMEN (56)	3.04	1.25
MORE EXP (39)	3.28	1.36
AVG EXP (44)	3.11	1.15
LESS EXP (54)	3.13	1.26
GENERAL (137)	3.17	1.25

QUESTION #67 - PEOPLE WHO GET PROMOTED IN MY DIVISION REALLY DESERVE IT

QUESTION #67	AVG	STD DEV
SENIORS (48)	2.75	1.02
JUNIORS (33)	3.09	1.38
FRESHMEN (56)	2.77	1.22
MORE EXP (39)	2.77	1.33
AVG EXP (44)	3.05	1.01
LESS EXP (54)	2.72	1.23
GENERAL (137)	2.84	1.20

QUESTION #68 - MY DIVISION OFFICER UNDERSTANDS MY JOB AND PROCESS I CONDUCT ON A DAILY BASIS

QUESTION #68	AVG	STD DEV
SENIORS (48)	2.29	1.17
JUNIORS (33)	2.48	1.25
FRESHMEN (56)	2.30	1.17
MORE EXP (39)	2.41	1.23
AVG EXP (44)	2.27	1.11
LESS EXP (54)	2.35	1.23
GENERAL (137)	2.34	1.18

QUESTION #69 - I KNOW WE HAVE TO BE PERIODICALLY EVALUATED BY REGULATIONS BUT I STRONGLY BELIEVE THAT THE SPECIFIC PROCEDURES UTILIZED BY MY SUPERVISORS CONTRIBUTE EVEN MORE TO CREATE ADDITIONAL BARRIERS FOR ME TO PERFORM A BETTER JOB

QUESTION #69B	AVG	STD DEV
SENIORS (48)	2.98	1.02
JUNIORS (33)	3.18	0.85
FRESHMEN (56)	3.23	1.01
MORE EXP (39)	3.10	1.05
AVG EXP (44)	3.23	0.94
LESS EXP (54)	3.07	0.97
GENERAL (137)	3.13	0.98

QUESTION #70 - MY SUPERVISOR UNDERSTANDS MY JOB AND PROCESS I CONDUCT ON A DAILY BASIS

QUESTION #70	AVG	STD DEV
SENIORS (48)	2.08	1.01
JUNIORS (33)	2.33	1.16
FRESHMEN (56)	1.98	0.96
MORE EXP (39)	2.33	1.22
AVG EXP (44)	2.02	0.85
LESS EXP (54)	2.00	1.01
GENERAL (137)	2.10	1.03

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QUESTION #71 - PEOPLE ARE ADEQUATELY REWARDED FOR THE JOB CONDUCTED

QUESTION #71	AVG	STD DEV
SENIORS (48)	3.02	1.16
JUNIORS (33)	3.09	1.26
FRESHMEN (56)	2.88	1.25
MORE EXP (39)	3.03	1.22
AVG EXP (44)	3.09	1.18
LESS EXP (54)	2.85	1.25
GENERAL (137)	2.98	1.22

QUESTION #72 - I BELIEVE THAT THE PERFORMANCE APPRAISAL SYSTEM ONBOARD REDUCES BARRIERS AND FOSTERS COOPERATION AMONG SHIPMATES IN DOING A BETTER JOB

QUESTION #72	AVG	STD DEV
SENIORS (48)	2.96	1.22
JUNIORS (33)	2.85	1.12
FRESHMEN (56)	2.59	1.12
MORE EXP (39)	2.97	1.25
AVG EXP (44)	2.98	1.00
LESS EXP (54)	2.48	1.18
GENERAL (137)	2.78	1.16

POINT #12 - GENERAL SUMMARY

POINT #12 (SUMMARY)	AVG	STD DEV
SENIORS (48)	2.79	1.15
JUNIORS (33)	2.99	1.22
FRESHMEN (56)	2.73	1.19
MORE EXP (39)	2.88	1.25
AVG EXP (44)	2.88	1.12
LESS EXP (54)	2.72	1.19
SUMMARY (137)	2.82	1.19

POINT #13 - ENCOURAGE EDUCATION AND SELF-IMPROVEMENT FOR EVERYONE

QUESTION #73 - I HAVE MANY OPPORTUNITIES PROVIDED BY THE SHIP TO IMPROVE MY EDUCATIONAL LEVEL

QUESTION #73	AVG	STD DEV
SENIORS (48)	2.02	1.16
JUNIORS (33)	2.45	1.18
FRESHMEN (56)	1.89	0.93
MORE EXP (39)	1.97	1.06
AVG EXP (44)	2.09	1.14
LESS EXP (54)	2.13	1.08
GENERAL (137)	2.07	1.09

QUESTION #74 - LEADERSHIP IS CONTINUOUSLY ENCOURAGING US TO TAKE ADVANTAGE OF THE OPPORTUNITIES FOR IMPROVING OUR EDUCATIONAL LEVEL

QUESTION #74	AVG	STD DEV
SENIORS (48)	2.17	1.10
JUNIORS (33)	2.48	1.23
FRESHMEN (56)	2.05	1.07
MORE EXP (39)	2.33	1.32
AVG EXP (44)	2.20	0.98
LESS EXP (54)	2.09	1.09
GENERAL (137)	2.20	1.12

QUESTION #75 - THE VARIOUS ALTERNATIVES PROVIDED BY THE SHIP TO IMPROVE THE EDUCATIONAL LEVEL OF THE CREW ARE EASY TO USE AND ARE REACHABLE FOR EVERY SAILOR

QUESTION #75	AVG	STD DEV
SENIORS (48)	2.25	0.93
JUNIORS (33)	2.67	1.11
FRESHMEN (56)	2.50	1.11
MORE EXP (39)	2.46	1.05
AVG EXP (44)	2.32	0.91
LESS EXP (54)	2.56	1.18
GENERAL (137)	2.45	1.06

QUESTION #82 - MY SUPERVISORS ARE WILLING TO PROVIDE ME WITH THE REQUIRED TIME TO USE SOME OF THE VARIOUS ALTERNATIVES PROVIDED BY THE SHIP TO IMPROVE MY EDUCATIONAL LEVEL

QUESTION #82	AVG	STD DEV
SENIORS (48)	2.46	1.13
JUNIORS (33)	2.39	1.17
FRESHMEN (56)	2.29	1.23
MORE EXP (39)	2.51	1.21
AVG EXP (44)	2.39	1.13
LESS EXP (54)	2.26	1.20
GENERAL (137)	2.37	1.18

POINT #13 - GENERAL SUMMARY

POINT #13 (SUMMARY)	AVG	STD DEV
SENIORS (48)	2.22	1.09
JUNIORS (33)	2.50	1.16
FRESHMEN (56)	2.18	1.11
MORE EXP (39)	2.32	1.17
AVG EXP (44)	2.25	1.04
LESS EXP (54)	2.26	1.14
SUMMARY (137)	2.27	1.12

POINT #14 - TAKE ACTION TO ACCOMPLISH THE TRANSFORMATION

QUESTION #48 - IN MY OPINION THE ONLY PEOPLE WHO ARE REALLY INTERESTED ON THE NEW APPROACH FOR QUALITY ARE THE LEADERSHIP. IT SEEMS TO ME THAT THEY WANT TO MAKE THE TRANSFORMATION BY THEMSELVES, THAT IS, WITHOUT TOO MUCH INVOLVEMENT OF THE CREW MEMBERS

QUESTION #48B	AVG	STD DEV
SENIORS (48)	3.21	1.22
JUNIORS (33)	3.33	1.11
FRESHMEN (56)	3.21	1.23
MORE EXP (39)	3.10	1.17
AVG EXP (44)	3.59	1.19
LESS EXP (54)	3.06	1.17
GENERAL (137)	3.24	1.19

QUESTION #61 - I BELIEVE THAT THE FOCUS ON QUALITY IS JUST ONE MORE PROGRAM THAT WILL FADE AWAY LIKE ALL THE OTHERS

QUESTION #61B	AVG	STD DEV
SENIORS (48)	2.81	1.28
JUNIORS (33)	3.18	1.18
FRESHMEN (56)	3.23	1.25
MORE EXP (39)	3.08	1.35
AVG EXP (44)	3.20	1.25
LESS EXP (54)	2.96	1.20
GENERAL (137)	3.07	1.25

QUESTION #76 - I BELIEVE MY CHAIN OF COMMAND IS COMMITTED TO QUALITY IMPROVEMENT

QUESTION #76	AVG	STD DEV
SENIORS (48)	2.42	0.92
JUNIORS (33)	2.76	1.03
FRESHMEN (56)	2.25	1.15
MORE EXP (39)	2.49	1.10
AVG EXP (44)	2.50	0.93
LESS EXP (54)	2.33	1.13
GENERAL (137)	2.43	1.06

QUESTION #77 - I CLEARLY SEE HOW THERE IS AN INCREASING NUMBER OF PEOPLE ONBOARD, ESPECIALLY THOSE IN THE TOP POSITIONS, COMMITTED TO THE NEW APPROACH TO MANAGE QUALITY. I WOULD SAY THAT SOONER OR LATER I WILL BE ALSO INVOLVED IN THAT ISSUE

QUESTION #77	AVG	STD DEV
SENIORS (48)	2.67	1.06
JUNIORS (33)	2.79	1.24
FRESHMEN (56)	2.39	1.04
MORE EXP (39)	2.62	1.25
AVG EXP (44)	2.45	1.04
LESS EXP (54)	2.67	1.05
GENERAL (137)	2.58	1.10

QUESTION #79 - I COMPLETELY IDENTIFY MYSELF WITH MY SHIP'S COMMITMENT TO UNDERGO A HUGE TRANSFORMATION RELATED TO THE WAY WE APPROACH QUALITY MANAGEMENT

QUESTION #79	AVG	STD DEV
SENIORS (48)	2.75	1.02
JUNIORS (33)	2.82	1.18
FRESHMEN (56)	2.41	0.91
MORE EXP (39)	2.69	1.20
AVG EXP (44)	2.80	0.95
LESS EXP (54)	2.44	0.95
GENERAL (137)	2.63	1.03

QUESTION #81 - I HAVE WITNESSED THE USE OF TQL TO SUCCESSFULLY IMPROVE AN AREA (OR A PROCESS) OF THE SHIP

QUESTION #81	AVG	STD DEV
SENIORS (48)	2.75	1.18
JUNIORS (33)	2.67	1.22
FRESHMEN (56)	2.52	1.11
MORE EXP (39)	2.69	1.20
AVG EXP (44)	2.55	1.11
LESS EXP (54)	2.67	1.18
GENERAL (137)	2.64	1.16

POINT #14 - GENERAL SUMMARY

POINT #14 (SUMMARY)	AVG	STD DEV
SENIORS (48)	2.77	1.13
JUNIORS (33)	2.92	1.17
FRESHMEN (56)	2.67	1.18
MORE EXP (39)	2.78	1.22
AVG EXP (44)	2.85	1.15
LESS EXP (54)	2.69	1.14
SUMMARY (137)	2.77	1.17

APPENDIX K. RUN CHARTS FOR WEAPON QUALIFICATION PROGRAM

INFORMATION TO SUPPORT RUN CHARTS OF PAGES ONE TO THREE

"A":   Qualification firing conducted at a range ashore

"U":   Qualification firing conducted at underway range

Note #1:   Changed weapon qualification and range procedures to Navy standards

Note #2:   Began on-range training and assistance (ashore only)

Note #3:   Added on-range briefing on Navy policies and procedures for the use and carrying of firearms, general weapons safety, and deadly force (underway and ashore)

Weapons Qualifications

Percentage Passing

Legend:
- Shotgun
- M-14
- Pistol

Y-axis: 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0

Range Dates: 28 Jan 94 A, 31 Jan 94 A, 4 Feb 94 A, 16 Mar 94 U, 25 Mar 94 U, 6 Apr 94 U, 9 Apr 94 U, 30 Apr 94 U, 4 May 94 U, 21 May 94 U, 4 Jun 94 U, 12 Jul 94 U, 24 Jul 94 U, 17 Oct 94 U, 21 Oct 94 A

Weapons Qualifications

Percentage Passing

Legend: Shotgun, M-14, Pistol

Range Dates: 24 Oct 94 A, 7 Nov 94 A, 14 Nov 94 A, 23 Jan 95 A, 7 Mar 95 A, 13 Mar 95 A, 23 Apr 95 U, 30 Apr 95 U, 30 May 95 A, 2 Jun 95 A, 13 Jun 95 A, 20 Jun 95 A, 27 Jun 95 A, 15 Jul 95 U, 12 Sep 95 U, 30 Nov 95 U

Y-axis: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

Weapons Qualifications
Percentage Passing

Legend:
- Shotgun
- Pistol

Y-axis (Percentage Passing): 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

X-axis (Range Dates): 9 Jan 96 A, 10 Jan 96 A, 7 Feb 96 A, 26 May 96 A, OPEN, OPEN, OPEN, OPEN, OPEN, OPEN, OPEN, OPEN, OPEN, OPEN

Range Dates

APPENDIX L. PAY AND PERSONNEL SUPPORT CUSTOMER EVALUATION

PAY AND PERSONNEL SUPPORT CUSTOMER EVALUATION

You are requested to complete this evaluation to assist in measuring the efffects of corrective measures being developed to improve service for pay and personnel support:

PAYGRADE: _____   DEPARTMENT: _____

1. Did you arrive at USS CARL VINSON with a pay problem (i.e., overpaid by Training Command)?   <u>Yes 65%</u>

2. Are you on DDS or Split Pay Option now?   <u>Yes 71%</u>   <u>No 29%</u>

Circle the # which best fits your opinion

	NONE	VERY LITTLE	SOME WHAT	ABOVE AVERAGE	EXTREMELY SATISFIED
3. How would you rate the command check-in process?					
a. Ease of check-in?	1	2	3	4	5
Survey results: (NOV 93)	12%	16%	35%	30%	7%
(AUG 95)	2%	5%	18%	51%	24%
b. Liquidation of travel claim?	1	2	3	4	5
Survey results (NOV 93)	20%	37%	22%	12%	9%
(AUG 95) *See note	16%	20%	27%	18%	19%
4. State your level of satisfaction concerning the following Disbursing Officer areas:					
a. Accuracy of pay?	1	2	3	4	5
Survey results (NOV 93)	8%	31%	41%	15%	5%
(AUG 95) **See note	12%	18%	39%	20%	11%
b. Promptness of Disbursing Office Service?	1	2	3	4	5
Survey results (NOV 93)	6%	28%	48%	12%	6%
(AUG 95) **See note	10%	16%	31%	25%	18%
c. ATM service?	1	2	3	4	5
Survey results (NOV 93)	14%	1%	21%	50%	14%
(AUG 95) **See note	15%	2%	16%	48%	19%
d. DDS?	1	2	3	4	5
Survey results (NOV 93)	3%	6%	46%	29%	16%
(AUG 95) **See note	10%	8%	28%	37%	17%

e. Hours of operation of Disburing Office?	1	2	3	4	5
Survey results (NOV 93)	8%	41%	38%	10%	3%
(AUG 95) **See note	12%	38%	42%	6%	2%

Circle the # which best fits your opinion

f. Do DK's treat you courteously?	1	2	3	4	5
Survey results (NOV 93)	8%	21%	41%	22%	8%
(AUG 95) **See note	12%	8%	36%	31%	13%

5. State your level of satisfaction concerning the following Personnel areas:

a. ESO service?	1	2	3	4	5
Survey results (NOV 93)	14%	39%	33%	10%	4%
(AUG 95) **See note	8%	27%	37%	18%	10%

b. Reenlistment Section?	1	2	3	4	5
Survey results (NOV 93)	2%	6%	48%	32%	12%
(AUG 95) **See note	2%	3%	21%	42%	32%

c. Transfer section?	1	2	3	4	5
Survey results (NOV 93)	3%	10%	46%	33%	8%
(AUG 95) **See note	1%	3%	21%	40%	35%

d. Customer Service Section?	1	2	3	4	5
Survey results (NOV 93)	7%	38%	41%	12%	2%
(AUG 95) **See note	1%	8%	12%	37%	42%

e. Do PN's treat you courteously?	1	2	3	4	5
Survey results (NOV 93)	6%	28%	35%	22%	9%
(AUG 95) **See note	1%	8%	18%	40%	33%

f. Promptness of Personnel Office Service?	1	2	3	4	5
Survey results (NOV 93)	3%	22%	48%	21%	6%
(AUG 95) **See note	1%	4%	18%	43%	34%

g. Hours of operation of Personnel Office?	1	2	3	4	5
Survey results (NOV 93)	2%	10%	29%	47%	12%
(AUG 95) **See note	1%	2%	7%	36%	54%

6. Rate the overall service provided by the Disbursing Office.

	OUTSTANDING	EXCELLENT	GOOD	SATISFACTORY	POOR	UNSAT
Survey results (NOV 93)	9%	12%	16%	27%	23%	13%
(AUG 95)	13%	29%	23%	18%	12%	5%

7. Rate the overall service provided by the Personnel Office.

	OUTSTANDING	EXCELLENT	GOOD	SATISFACTORY	POOR	UNSAT
Survey results (NOV 93)	13%	26%	30%	10%	16%	5%
(AUG 95)	21%	32%	43%	2%	1%	1%

Note: Since disbursing functions were not yet consolidated with the personnel functions, minimal customer satisfaction improvements were experienced: improvements realized were due to improvements to existing disbursing operations. ESO.

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